December 1976

Smithsonian

Robert Osborn, at upper right, and a holiday gift of airplane cartoons (back cover and p. 52)

Also in this issue: the controversial U.S. Army Corps of Engineers

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December 1976

Smithsonian

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EXXON HEADS TO SEA–TO OPEN A NEW FRONTIER OF ENERGY.

The energy under America's deep waters can help reduce our dependence on foreign oil. Here's what Exxon is doing to get that energy to you.

The huge structure being towed past the skyline of San Francisco is one half of the world's tallest offshore drilling and production platform.

When the entire platform is completed, it will stand nearly as tall as the Empire State Building. In fact, it would fit over the tallest skyscraper in our photograph.

Exxon designed this platform to produce energy where no one has produced it before—from under 850 feet of water on America's outer continental shelf. Beneath this shelf are reserves of oil and natural gas that are needed to help reduce the amount of energy we have to import.

If you're interested in a few specifics: the platform alone cost Exxon over $70 million to build (total cost for the entire project will exceed $500 million). It stands about five miles off the California coast, and nearly doubles the world's water depth record for this type of structure. When full production is reached, it will handle some 60,000 barrels of crude oil a day—that's enough energy to fuel 438,000 cars, plus heat 165,000 average-size homes, and provide electricity for 370,000 average-size households a day.

These facts may help you appreciate why finding new supplies of energy today is a challenging, costly and risky venture.

If America is going to take advantage of all its energy resources, it needs companies with experience, research capabilities, technical know-how, and the financial strength to make tremendous investments and take tremendous risks.

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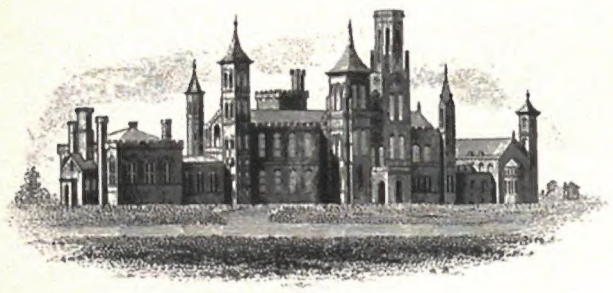
The view from the castle



The glamorized exhibition catalog, sleek but insubstantial, seems at last to be giving way to works of real scholarship

A new trend is the giving up of highly expensive, glamorously wrought catalogs of art exhibitions which are little more than lists of objects. Too often foundations or corporate sponsors have been gulled into financing some hefty tome, beautifully illustrated (in color), a monument to the narcissism of the lenders or the excited ambitions of the museum director. And too often these purposeless catalogs end up in windrows on status-laden coffee tables.

As a refreshing change, the Bicentennial show at the Smithsonian's National Collection of Fine Arts sells a simple checklist catalog, explaining the manner in which the exhibition, "America as Art," is arranged, theme by theme, with a list of paintings and ready reference material, for only $1.25. Coincidentally, Director Joshua Taylor has written a book, under the same title, which is separate, a textbook as it were, a solid piece of scholarship for schools, colleges, art historians and the like, which sells for $25 in hard cover and $9.60 in soft. This is sensible and workmanlike. The exhibition itself comes and goes, but there is an art-reference catalog of this ephemeral event to file in the art library. The main work, which lives on, is a book about a topic temporarily illuminated by the exhibit.

So it is with *The New Golden Land* by Hugh Honour, which he wrote in conjunction with a fascinating exhibition at the National Gallery of Art, "The European Vision of America," for which he was guest curator. Mr. Honour's book stands on its own merits, as do the three books published by the National Portrait Gallery in connection with its Bicentennial exhibitions (two of the books deal exclusively with the Revolutionary War period and the third covers the period from 1776 to 1976). Funds should be available for such works. Unfortunately, those who give funds for art museum exhibitions do not always get their scholarly money's worth. This is dismaying in these days when museums are struggling to make themselves understood and appreciated as centers of intellectual productivity, and thus deserving of support, even as are the universities.

Sometimes it is hard to prejudge the merits of the case. Marilyn and Shen Fu's *Studies in Connoisseurship: Chinese Paintings from the Arthur M. Sackler Collection in Princeton and New York* is a creation of such surpassing quality that it stands by itself as a definitive exposition of the subject. Would that Chinese art historian Allan Priest had lived to see it! It would have delighted his soul, as it does the art historians of today in this special field. When one thinks of the seminal influence of the early Museum of Modern Art catalogs by Monroe Wheeler, Alfred H. Barr jr., James Johnson Sweeney and René d'Harnoncourt, which live beyond any coincidental exhibition, one sees that these volumes have had a formative influence on a generation or more of artists and scholars.

For myself, the catalogs of this Bicentennial year have been both a delight and a disappointment, while the accompanying volumes, such as those mentioned above—the new way of publishing art history—have proved that art museums are really becoming centers of productive scholarship. Three cheers.

S. Dillon Ripley

When I was a child, I spake as a child, I understood as a child, I thought as a child: But when I became a man, I put away childish things. — *I Corinthians*

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Letters to the Editor

Aging and the life-span

Dear Sir: Albert Rosenfeld's article, "In only 50 years we may add centuries to our lives—if we choose to do so," in the October issue, mentioned that the genetic structure of DNA probably bears the formula for the duration of life of the individual species member. May it not be that the same DNA bears the formula for the longevity of the entire species? No form of DNA, of either flora or fauna, should be expected to replicate itself forever and ever. Man's destiny on this planet may well be indelibly prescribed in his inviolate DNA constituents, irrespective of many recent so-called advances in genetic research.

L. A. Whitehill, M.D.

San Angelo, Texas

Author Rosenfeld agrees that what is written into the individual's genes does also apply to the rough life-span of the species. The article, he points out, was not saying that the individual will live forever—someday even the sun will die. But there have been real advances in genetic research, and there are many circumstances in human life that seem to be inevitably built into nature, until a greater knowledge of their mechanisms shows they are not inevitable. Ed.

Plains Indian life

Dear Sir: In your article, "A great painter, a royal naturalist on wild Missouri," the painting of the American flag flying above the ramparts of Fort McKenzie just does not look as it should have for the time and place. A close study shows that it has 48 stars on the blue

field. It was prophetic of the artist to envision so many years in advance the number of states we would have in the Union for so many years.
Charles L. Barron
Tallahassee, Florida

Dear Sir: As proof of my enthusiasm for your excerpt of the book *People of the First Man: Life Among the Plains Indians in Their Final Days of Glory,* here is a photograph of a wood carving [see below] I have just finished—that is, except for painting the beadwork and the robe with Karl Bodmer's design. The figure is basswood and 23 inches high.
Ralph H. Bower
Goshen, Indiana

Litchfield Post Office

Dear Sir: Please—a correction for the article "How a post office can also be the heart of a village." The picture captioned "Architectural historian Brown . . ." should have read "Former First Selectman Robert D. Cooley."

It was mainly through Mr. Cooley's efforts that it finally will remain where it is.
Doris Keller Hamlin
Litchfield, Connecticut
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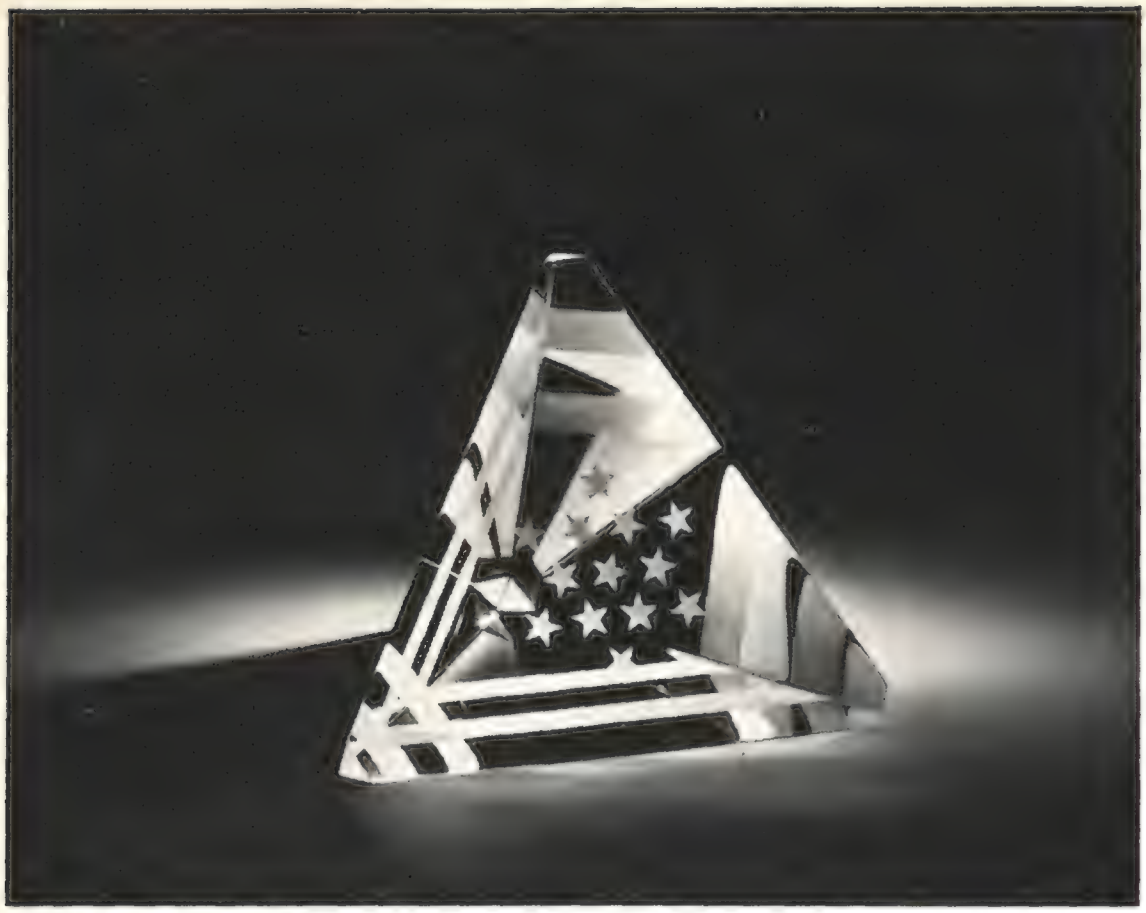

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rapher's captioning error straight with correctly labeled photographs below. Ed.

North Easton historian Robert F. Brown

Former First Selectman Robert D. Cooley

Neon

Dear Sir: Having read and enjoyed your article on neon signs, I must tell you about another sign with ethnic charm. In Ellenville, New York, near where I grew up, there was for many years the "Shamrock—Chinese and Italian Food." It was

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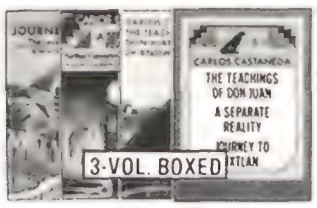

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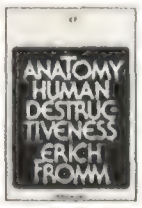

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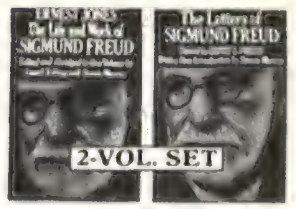

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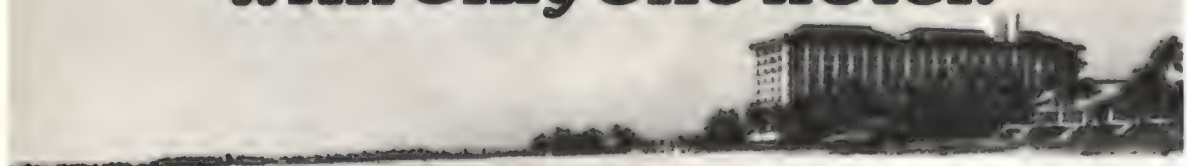

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Cycling injuries

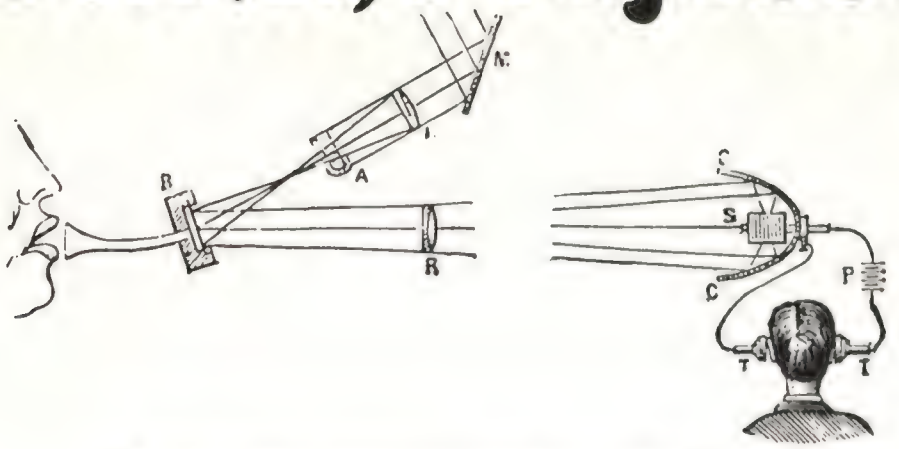
Dear Sir: Your statistic of 476,000 estimated bicycle injuries in the United States in 1975, quoted in "Phenomena, comment and notes," corresponds roughly to the 459,000 estimated by National Electronic Injury Surveillance System (NEISS). But a closer look shows these projections are based on the number of people who go to hospitals with injuries. NEISS sample data show bicycle injuries were second; injuries caused by stairs, ramps and landings were first. Of those taken to hospitals for bicycle injuries, 96 percent were treated and released; four percent required hospitalization. Of 400 accidents investigated by the Consumer Product Safety Commission it was found that about 15 percent of the injuries were equipment related.

Many bicycle clubs such as the one to which I belong give free clinics periodically. Perhaps the government, instead of publishing pamphlets on how to keep bicycles in operating condition, might more profitably sponsor clinics to eliminate human error.
Paul D. Blumstein
Torrance, California

Orchestrion

Dear Sir: Edwards Park's description of the orchestrion in "Around the Mall and beyond" really got me excited. I could hear in my mind's ear that wonderful music machine Brian Jensen gets to play every day, and began to get jealous of a person who could have such a pleasant job and get paid for it at the same time. My feelings were momentarily allayed as I felt there would be an order blank at the end of the column so that one could order a record of such delightful sounds. But no! You do have plans to cut a record, don't you? Please!
Dale R. Harber
Yoder, Indiana
Yes, in the near future, but not in time for Santa Claus. Ed.

What's next, Professor Bell?



The photophone transmitted voices on a beam of light in 1880.

Alexander Graham Bell

"The greatest invention I have ever made; greater than the telephone." That's how Alexander Graham Bell rated his photophone, patented four years after the telephone, to transmit conversations on a beam of light. (Photophone = light-sound.) He actually demonstrated lightwave transmission of voices, but it would be nearly a century before it would become a practical reality.

The photophone was one of many ideas Bell proposed to improve the usefulness of his basic invention. Working with him on improvements were his assistants Thomas A. Watson, who received the world's first telephone call on March 10, 1876, and Charles S. Tainter. The sort of work they did would be called today "research and development".

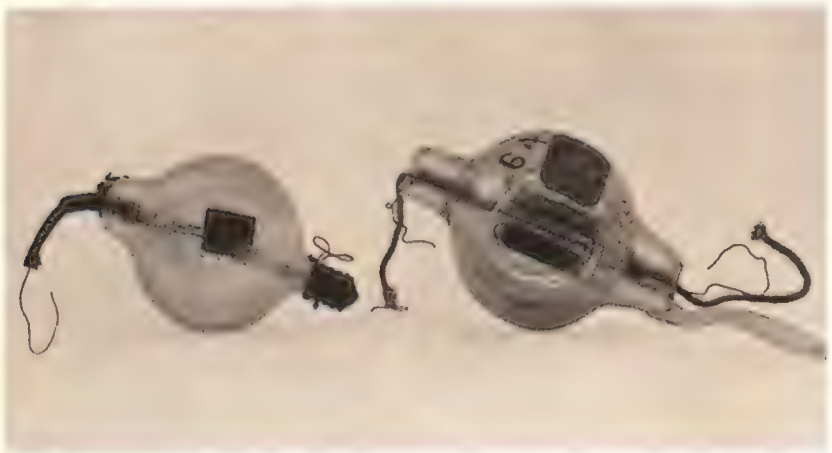
Bell envisaged a telephone network linking the cities of the nation and eventually the whole world. But a voice could travel only a limited distance over a wire before it weakened and became inaudible. So the first phones depended heavily on lung power. It is no coincidence that we speak of telephone "calls", or that the word "hello", the standard greeting in phone conversations, is kin to "holler".

For years many people looked for a way to make a voice reach from coast to coast, including engineers of the American Telephone and Telegraph Company (the parent company of the Bell System), and its manufacturing and supply arm, the Western Electric Company. Some telephone people were much interested by a paper read to the American Institute of Electrical Engineers on October 20, 1906, by Dr. Lee de Forest. The paper described de Forest's new "audion" tube, a version of the vacuum tube used at that time in radio receiving sets. Basic theory told de Forest that his invention should detect *and amplify* tiny electric currents, such as those coming over the telephone

In 1886 this special telephone set was used for long distance calls.

wire. But his early models failed at amplification. He continued working on his own. And telephone engineers pursued other solutions.

By 1912 de Forest was ready to demonstrate an improved audion that did operate as an amplifier, although imperfectly. In the group of telephone people assembled for one of de Forest's demonstrations was Harold D. Arnold, 29, a brilliant physicist hired the year before. Arnold identified at once the audion's major problem: the vacuum pump de Forest was using left too much air inside the tube, with the result that its performance was erratic and unpredictable. As a consequence of financial support by AT&T of the Bell System's research and development program, Arnold could obtain the newest pumping equipment and achieve a much higher vacuum, and within a year he had the amplifier needed. AT&T and Western Electric engineers made further circuit changes needed for telephony, AT&T management arranged for manufacture under de Forest's basic patent, and the amplifier went into production. On January 25, 1915, Bell in New York repeated to Watson in San Francisco his famous words, "Mr. Watson, come here. I want to see you."



Lee de Forest's audion and an improved version developed by H. D. Arnold for long distance telephony.

As the telecommunications industry grew, the vacuum tube was improved many times, but by the 1940s it was reaching its inherent limitations. Scientists at Bell Laboratories saw promise in a class of materials called semiconductors. From their carefully thought-out search came the discovery in 1947 of the transistor effect—the amplification and control of the flow of electrons in a solid material. Again the enormous problems of putting the discovery into practical form were far more quickly and expertly solved by collaboration between people at Bell Labs and Western Electric than could ever have been the case otherwise.

The story of the search for ways to strengthen telephone voices shows, in a rather simple way, many of the elements of the Bell System's research and development effort as it is carried on today: A perceived need in telephone operations. Corporate management that emphasizes service improvement. A commitment to exploration in relevant areas of basic science. A development effort, adequately funded, to move from discovery to practical use. Free exchange of information among people in research, development and manufacturing. And finally use of the discovery in equipment or a product to meet the need originally perceived. That final stage is what gives a laboratory discovery the right to be truly called an "innovation". And the expectation that applicable new knowledge will be used in the Bell System makes it possible to commit each year the millions of

H. D. Arnold

dollars necessary to search for it.

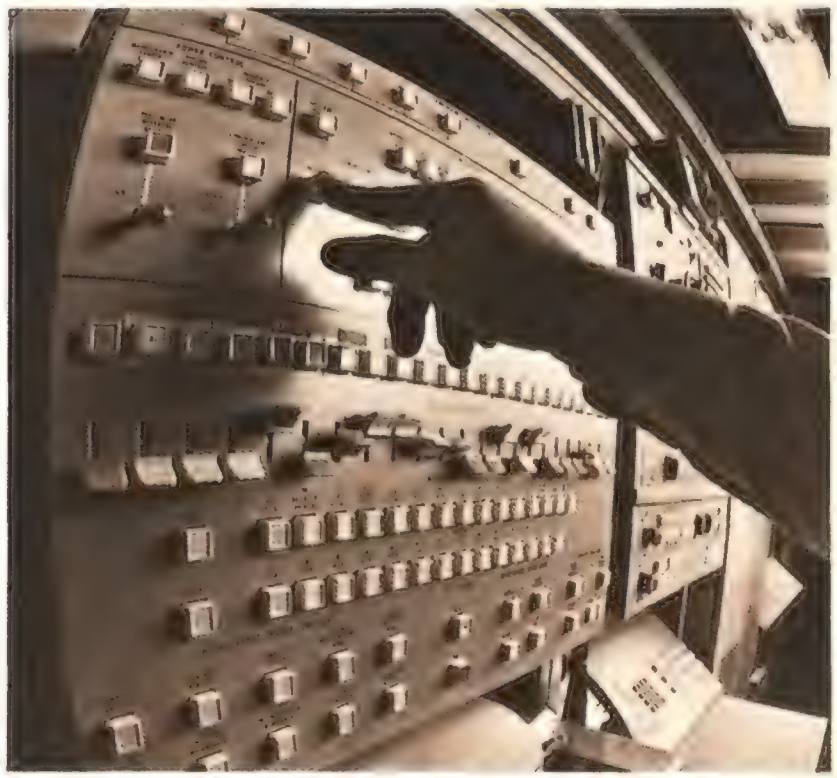
The amplifier story has an extra dimension, the use of innovations in many fields outside telephony. That is true of much Bell System research and development. It is corporate policy to publish new findings, to make new technology available to other companies through licensing arrangements, and to exchange technology with others. Vacuum tubes made possible radiotelephones, television broadcasting, improved phonographs and sound motion pictures. Scientists and engineers working for the Bell System made many contributions to all these innovations and the new industries that sprang from them. But the main objective of their investigations has been the improvement of the nation's telecommunications network and the myriad of services it provides.

The transistor, in its turn, gave birth to the whole new industry of solid-state electronics. It made practical such developments as the large-capacity computer for data processing, high-speed transmission of data between computers, space travel and communications via space satellites. Most important for the ordinary telephone user, the transistor made possible a new generation of switching machines for routing calls to their destinations—machines controlled by instructions stored in changeable memories. These electronic switching systems, now being installed, are many times faster than the best electromechanical systems. They provide enormously increased capacity and flexibility to meet the growth needs of the 1980s.

It is characteristic of a technologically oriented industry that technology must be prepared in anticipation of needs. The search requires a huge investment, both of time and money. And success depends on careful planning and close coordination of effort, in a process that runs from basic scientific exploration through fundamental development work, specific design, manufacturing capability, distribution and delivery to the ultimate consumer. For many industries, including telecommunications, the process also includes activities in maintenance, servicing and operation.

The transistor was invented at Bell Labs in 1947. Today, thousands of transistors can be made on one tiny integrated circuit chip.

In the Bell System, that process involves twenty-three regional operating companies, plus Bell Labs, Western Electric and the Long Lines Department. All these parts share one goal: to provide telecommunications services at the lowest possible cost to everyone.



Electronic switching systems, now in wide use, provide high speed and flexibility for the nation's telecommunications needs.

Such cooperation produces results.

According to the June 28, 1976, issue of *Business Week*:

By almost any measure, Bell Labs has contributed more to the telecommunications industry and more to the U.S. economy than any other research establishment....A major part of Bell Labs' charter is to keep well ahead in technology so that no significant development applicable to telecommunications will be unavailable to the Bell System. The bargaining power made available through extensive patent holdings gives AT&T ready access to the inventions of others when the company needs them.

Since 1925, the people at Bell Labs and Western Electric have received more than 24,000 U.S. patents, which have been made widely available to all of U.S. industry and the world.

Bell System research and development work is well underway on new communications technologies to meet the needs of telephone service in the future. For example, Bell scientists and engineers are now working on a practical way to use lightwaves for communications. They have already developed pinpoint light sources—light-emitting diodes, and lasers no larger than a grain of sand. (Both projects benefited from earlier Bell research on semiconductors.) To carry

Lightwave communications technology, now being tested, uses new solid-state light sources and glass fibers to transmit phone calls.

light around corners, or under city streets, they are using tiny strands of ultra-transparent glass called "lightguides." Right now an experimental lightwave communications system is being tested by Bell Labs and Western Electric engineers in Atlanta. Light and glass may one day join electricity and copper wire in the nationwide telecommunications network, and we may in fact "talk by light". Those are Alexander Graham Bell's words, describing his photophone.

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Bell System

Around the Mall and beyond

As you enter the Division of Transportation in the Museum of History and Technology—the area, that is, where antique trains, cars and cycles lure the automotive freaks—you come face to face with the stained-glass window below. It's a sight regular visitors take for granted, aware of it, to be sure, but never stopping to look at it because their minds are on the Clarke gasoline-powered tricycle of 1897, just to the right, or the Duryea of 1893, farther along, or the Haynes or the Balzer, both of 1894. Fine historic vehicles, all of these, but none so modestly elegant, so quietly regal as the 1907 Rolls Royce Silver Ghost displayed on that stained-glass window.

The car shown was factory number two of the Silver Ghosts—the second one ever made. It was originally bought

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"O, if men were all like that wise bird!"
Punch

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by a sportsman who removed the factory body, substituted a racing body and presumably used the car in competition. Years later, Millard W. Newman, a wealthy Florida car buff with a number of beautiful and notable cars in his collection, found the chassis of Old Number Two and restored it to its original grandeur as a touring car, not a racer. He became so enamored of his splendid acquisition that he decided to take it with him, so to speak, when he died.

At considerable cost, Mr. Newman had his Rolls immortalized in a stained-glass window designed to go into the mausoleum he was preparing for the time when he would be called away from this mortal traffic jam. In death he would be accompanied, symbolically, by his old favorite.

The trouble was that Mr. Newman and his wife took a fresh look at the mausoleum, just to see if everything seemed comfy, and between them they decided that the window image of Old Number Two didn't really belong there. So out the stained glass came, and off to the Smithsonian it went. Thanks to Millard Newman, the spirit of that old Silver Ghost has been subtly pleasing thousands of sightseers instead of whispering off down that Great Expressway in the Sky.

I learned this story from Don Berkebile, the curator in charge of all those cars and bikes. But I got the right clues from Bess Hormats, Research Coordinator for the Smithsonian project called the Smithsonian Art Index. The idea of this is to catalog, at long last, all the items at the Institution which can be considered works of art, but which are not displayed in any of the Smithsonian art galleries.

Bess says that people are constantly writing to the Institution wanting to know "what has happened to the painting of butterflies that my great-grandmother donated to the Smithsonian in 1880?" or "Where is the bust of my great-uncle which was bequeathed to the Smithsonian when he died just after World War I?"

If those items happen to be in the Museum of History and Technology, Natural History, Air and Space, the Zoo or other facilities, they are listed as specimens according to subject but may very well never have been catalogued as art—at least until now. The Art Index will serve as a central source for use by researchers as well as the interested descendants of

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How long will it take? Well, don't hold your breath, because the project started last April, and there is so much to catalog that no one dares suggest a closing date. When you realize that many scientific drawings and prints have, over the years, achieved the status of works of art (Audubon's birds and Catlin's Indians were originally painted for scientific purposes), and that there are thousands of these in the nonart collections, you can see that the indexers face a mighty task.

Bess Hormats says that items to consider at History and Technology include figureheads, plans of ships and lithographs of old bridges. There are prints of fire engines and early locomotives that qualify as art. There are Currier & Ives prints and there is a stained-glass depiction of Nipper, the RCA dog, listening to His Master's Voice.

Adjusting my eyes to see this sort of thing instead of the wondrous displays in the Museum of History and Technology, I roamed through some of the halls and noted:

- A very dark painting of a fire in a dark corner of the transportation section. It needs to be cleaned, but looks as though it is pretty good.
- A painting in the trains section called *Removing the Last Rock* which alludes to the completion of the New York-to-Brooklyn Tunnel in the early 20th century. This one *doesn't* look very good, but I guess it's art.
- A replica of a Greek bas-relief dating from about 450 B.C. which shows the Greek foot and fathom. It's a broad fragment of a man's arms and shoulders as he stretches out to give the measurement. The original is at Oxford University.
- A nice painting called *The Blacksmith* by Carroll Beckwith of the National Academy. I forget just where I saw this one, but it was in an area of the museum that dealt with metalworking.

Flushed with my discoveries, I broke away from this museum—reluctantly, as always—and hurried down Constitution Avenue to the Natural History Museum. On the walls of the "Our Changing Land" exhibition on the Constitution Avenue level are two murals of the Potomac River Basin, one of a scene in 1776 and one 200 years later. I like the second one especially because it includes David Challinor, the Smithsonian's Assistant

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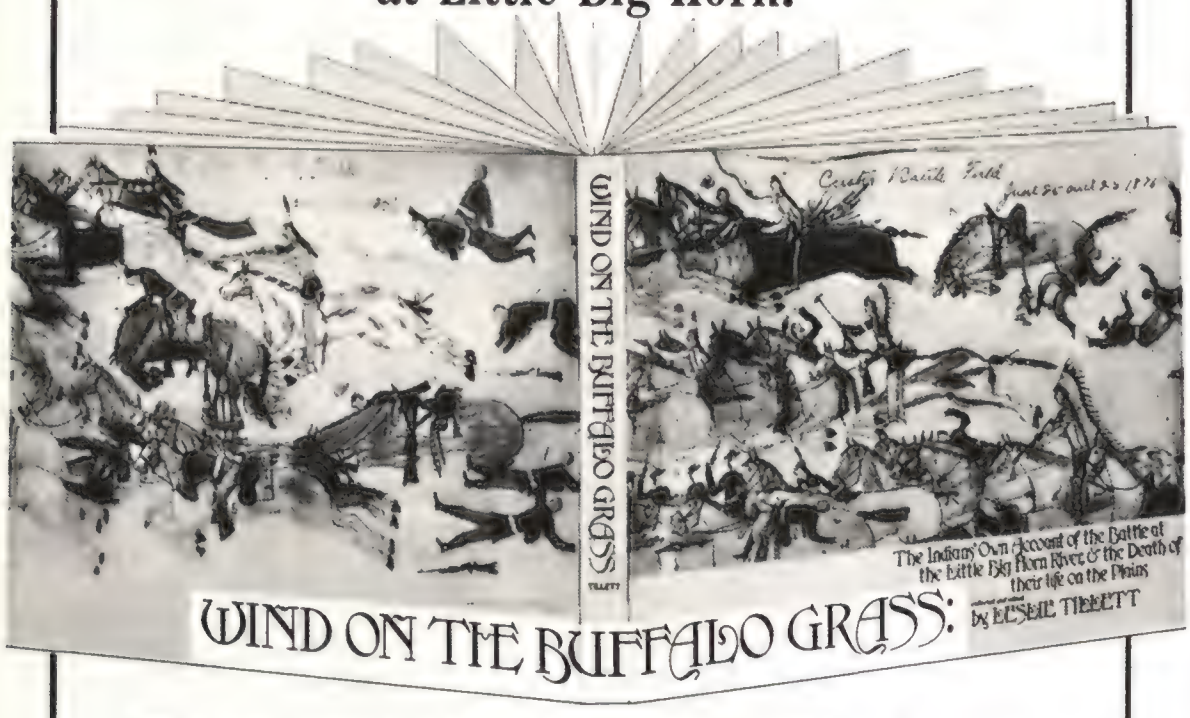
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Secretary for Science, swinging by in a single scull. Dr. Challinor once rowed for Harvard and now is a permanent, floating fixture on the Potomac, so it was almost inevitable that the muralist would include him. After all, you can't really look at the river without seeing him.

But I really don't know if a mural qualifies in this survey. It would be difficult to move it to an art gallery (Dr. Challinor and all), so I suppose that these two nice scenes must not be counted. On the other hand, upstairs in the gallery of the museum rotunda are those splendid bronze statues of Congo natives by Herbert Ward—marvelously muscled bodies and faces alive with passion, hate, fear, absorption, concern. Any art scholar will tell you, as I have been told, that these are pretty corny nowadays. But I think that down deep everyone likes them. Certainly the kids do. The toes of the Congo artist are polished down to their original glinting bronze by small hands that have been unable to resist the temptation to touch, whether lightning strikes or not.

I was distracted from further exploration in the Museum of Natural History by word of a living coral reef being created and nurtured in one of the offices. Nose twitching in boundless curiosity, I ferreted out Walter Adey, a curator in the Department of Paleobiology, who showed me a 350-gallon tank in his office, absolutely alive with forms of coral and other marine growths. This experimental tank is a year old and contains 350 to 400 species, including a sea urchin and some brilliantly colorful reef fish. Huge lamps overhead give it about three-quarters of the light it would receive from the sun and keep the temperatures at tropical heights. They are similar in spectrum to ordinary daylight.

A steady current washes over the top of the reef from the deep side—the "fore reef," which in nature would drop away to the depths—to the lagoon side, shallower with a sand bottom. This simulates tidal action.

Walter Adey says the setup was started with slabs of dead coral piled up in the tank full of salt water—some of which came from the Woods Hole Oceanographic Institution. Borers were put in to get a toehold in the dead coral base. Other organisms followed, to multiply and prey and be preyed upon.

"We have no higher predators," he told

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me. "We've only lost two reef fish. They got caught in the pumps."

I watched the dazzling little creatures slipping through tendrils of vegetation and over the spongy hummocks of live coral and past the black spines of the sea urchin. The water streamed gently over the shallowest part of the reef, the bright light sparkled on the wavelets, and suddenly I was quite sure that I was really snorkeling in the Bahamas instead of standing on the third floor of a museum.

One day, still fairly far into the future, a huge tank, six feet tall, four feet wide and 12 feet long, will be set up on a lower level of the museum, and everyone will be able to see the life of a coral reef. It will hold 1,500 gallons of water which will churn over the top in waves. These will be manufactured waves, formed by a bucket device which was tested in the small tank. It proved so effective that it cracked the glass.

And so, as the waves wash across this small piece of atoll, as the "sun" beats down, as the fish dart and the other organisms inch and swell and throb and change color and grow and die and eat each other and clean up the wastes and maintain a balanced segment of life—as all that happens right in front of everyone, that elusive word "ecology" will begin to mean something.

Ruminating, I left Walter Adey and tried to get my mind back on the nongallery art. And then I dimly realized what everyone else has by now clearly seen—that the Smithsonian had been revealing a new and fascinating theme: things displayed in places other than where you would expect them. Just downstairs in the Natural History Building, hordes of visitors were absorbed with the Insect Zoo.

I had been looking at a living coral reef, prototype of one that will be on display. Strictly speaking, don't living exhibits belong in the National Zoological Park? And the answer rang clearly: not at the Smithsonian, dumb-dumb.

This place hangs very loose. It's got paintings and sculptures in museums that are not devoted to art; it's got music echoing from halls that were never designed to house a concert; it's got living creatures doing their stuff outside the Zoo, whether they be blobs of coral, praying mantises or costumed docents singing old songs at the Steinway in "1876," or running the

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old printing presses or tending the elegant old steam engines. (Not that docents belong in the Zoo. But this kind of "acting out" doesn't belong in a musty, traditional museum, either.)

The Museum of History and Technology had live bees operating last summer, along with a live "Revolutionary War soldier" who went on display at intervals, cleaning his kit and showing the kids how to handle a musket.

Nongallery art does not necessarily occur in every nonart museum. Two portraits stand in the military section of "1876" at the Arts and Industries Building. One is General Berdan, who organized a famous group of Union sharpshooters, and the other is General George B. McClellan, a handsome devil with curling moustache. Perhaps these are considered art, but I think they are not. Also in the "1876" collection is the original *Arkansas Traveler* painting by Fortenbury, and a huge panel of tiles entitled "Fire and Water," which shows a rather ugly and misshapen partly nude male rising phoenixlike from the flames. As far as art is concerned, he should have stayed in the fire.

Oh, but there are some nice old busts and ceramics in the exhibit. These must certainly qualify.

Stuffed animals seem always to belong in a natural history museum, right? But again the Smithsonian comes through with marvelously muddied concepts. For in the Museum of History and Technology are three stuffed beasties: two mammals and a bird.

One is General Sheridan's horse. It stands in the Hall of Armed Forces History, commemorating Sheridan's ride to Winchester, Virginia, to stem a Union retreat and turn the tide against the Confederates. Sheridan did this on his horse, Rienzi, and both were immortalized for the event in a poem by Thomas Buchanan Read, "Sheridan's Ride." The horse had his name changed to Winchester and got stuffed.

In the Division of Postal History is a dog, Owney, a mascot of postal workers in Albany, New York, in the 1880s. He was beloved enough, apparently, to rate a stuffing, too. And not far from him is the famous W.W. I carrier pigeon, Chère Amie. There's another pigeon too, but I can't remember its name, because I hate most pigeons, anyway.

EDWARDS PARK

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Johnston & Murphy, A Division of Genesco
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Jingle Bells

What better way to ring in the holidays and express the spirit of friendship than with the gift of rare taste.
A Christmas tradition for almost 100 years.

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SCOTCH

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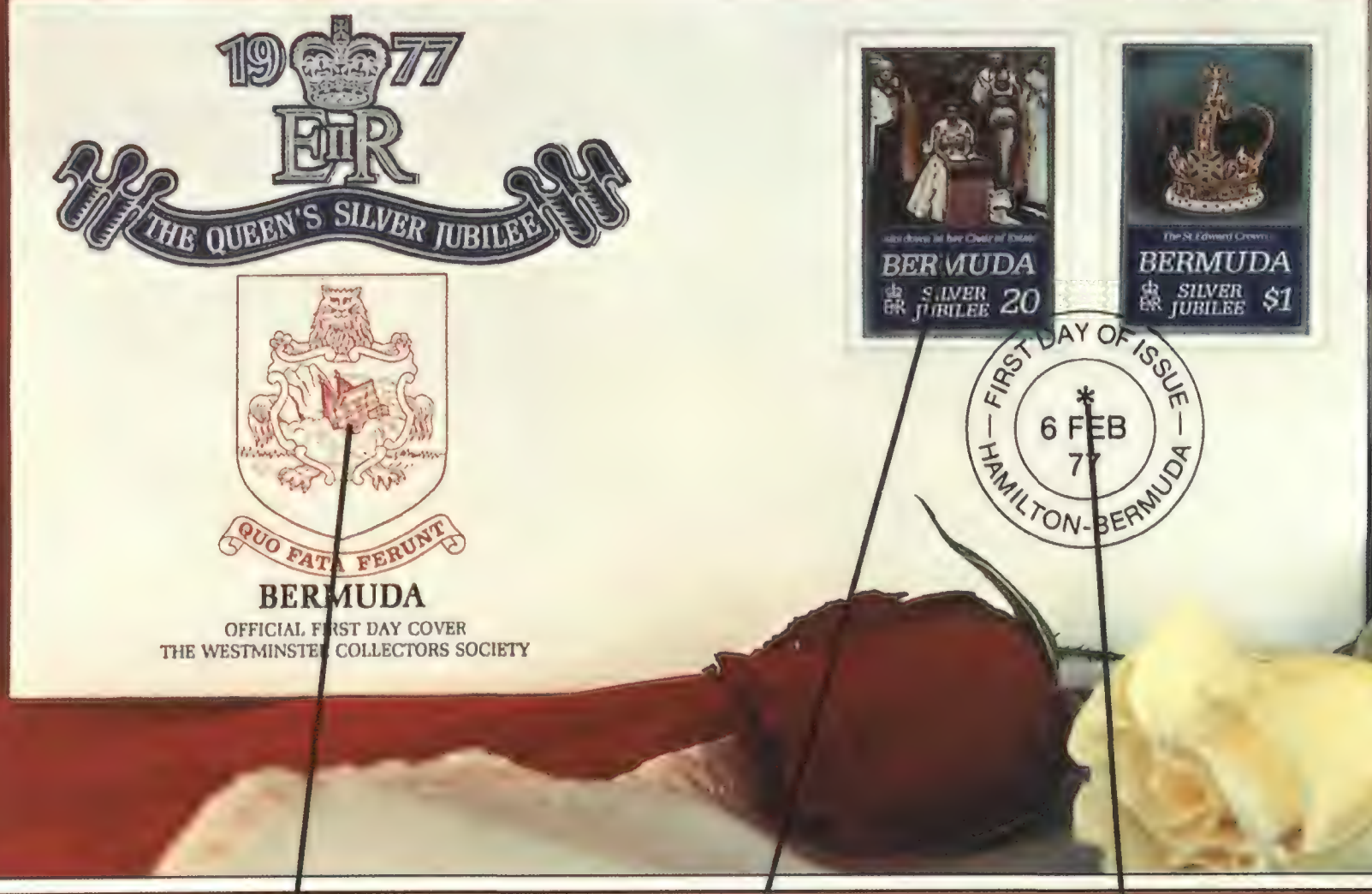
On behalf of the Westminster Collectors Society
Fleetwood proudly presents a magnificent tribute to

The Queen's Silver Jubilee

a Collection of Official First Day Covers soon forthcoming.



Shown about four-fifths size.
Actual size: 7½ by 3⅜ inches.

Flawlessly engraved, each individual cachet has been crafted exclusively for this series and will bear the authentic Coat of Arms or Emblem of each Nation.

More than forty nations will issue the uncommonly beautiful stamps which together preserve the pageantry and meaning of Coronation. Artists' concepts of stamps and postmarks used for illustrative purposes.

Available only on the First Day of Issue, the Official First Day of Issue Postmark certifies the *first*-edition. It is *officially*-applied at the city of issue, in the country of origin.

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A Limited Edition Collection.
Available by Advance Subscription Only.
Limit: One subscription per person.
Subscription rolls close February 6, 1977.

A quarter of a century ago, a great domain — nearly one-fourth of the earth and nine times vaster than the Roman Empire at its zenith — lay under her scepter.

Now, as Her Majesty, Queen Elizabeth the Second, prepares to celebrate her Silver Jubilee, she is Queen of fewer lands, but not of fewer hearts. In her person The Crown remains a human link among a quarter of the world's peoples. The symbol of mutual cooperation that stems from a common history. The heritage of an Empire on which the sun never set. The focus of an allegiance given through love and respect.

Heiress of a thousand years of history

By the Grace of God, Queen of the United Kingdom, its territories, and more than ten other independent Nations, she reigns but does not rule. Head of the Commonwealth of more than thirty realms and republics, she presides but does not direct. Yet, hers is a voice which is heard. The advocate of a happier, more just, and more gentle world for her peoples and the whole of the human family.

Truly an anchor in the tempest of the modern age, the Queen is heiress to noble ideals as timeless as the Coronation Ceremony at which she — like her predecessors since William the Conqueror in 1066 — was crowned at Westminster Abbey.

An unprecedented philatelic event

It is therefore fitting that to celebrate *The Queen's Silver Jubilee* in 1977, some forty Commonwealth members will preserve the pageantry and meaning of the Coronation in an *international* series of nearly eighty stamps.

Significantly, the scope and concept of this collection are *unparalleled* in philatelic history. For, *never before* have so many Nations cooperated to issue a series of stamps which, when viewed as a complete collection, captures an event of this magnitude.

And, *never before* has there been a collection which traces step by step the events of the Coronation. Or portrays the Crown Jewels and Coronation Regalia in all their beauty.

Individually designed by the Commonwealth's most prominent artists — perhaps the greatest assemblage of talent ever gathered to a single purpose — each issue will be a masterpiece of the philatelic art. Together capturing with uncommon sensitivity the Coronation's glittering panoply of tradition, religious rite, and chivalrous pageantry.

Ascension Island opens this timeless story with the golden State Coach departing from Buckingham Palace pulled by eight Windsor Greys enroute to Westminster Abbey.

In Montserrat's issue, the actual moment of crowning seems to echo within the Abbey's hallowed walls.

And, vividly portrayed by the issues of Turks and Caicos Islands, loyal subjects cheer the Queen and Royal Family as they wave from the Palace balcony following Coronation.

From beginning to end, this great ritual unfolds. Inspired by a thousand years of

history. Recorded in painstaking detail by official stamps of Canada, Barbados, New Zealand, Hong Kong, Australia, Gibraltar, and others. A collection worthy of *The Queen's Silver Jubilee*, and an inspiration for our times.

Available to you: the First Editions

The unprecedented character of this tribute to *The Queen's Silver Jubilee* makes your opportunity today to acquire *first editions* all the more significant. For it is a collection certain to command the attention of collectors and historians for many years to come. And the *first editions* . . . First Day Covers . . . will be but a *small fraction* of the total number of stamps sold to the public.

First Day Covers of the individual stamps marking *The Queen's Silver Jubilee* will be available only on the exact date the stamps are first issued, and never again. In many countries, the First Day of Issue will be February 6, 1977: the precise twenty-fifth anniversary of Her Majesty's accession to the Throne.

Applied as part of lavish Jubilee ceremonies attended by leading officials and citizens of each Nation, the coveted, one-day-only, First Day of Issue postmark will indelibly certify the First Day Cover for posterity and guarantee its authenticity and limited edition character.

A superb, limited edition

Appropriately, the Westminster Collectors Society will issue *The Queen's Silver Jubilee* in *one* complete collection of over forty official First Day Covers. Of special importance to collectors, this is the *first* collection ever authorized by the Society, which was established under the auspices of Fleetwood, America's oldest purveyor of First Day Covers, to encourage a greater appreciation of British and Commonwealth culture, history, and tradition.

As befits a collection of this importance, each First Day Cover will be lavishly *engraved*. Each will bear the Coat of Arms or Emblem of the issuing Nation, as well as the imprimatur of the Society.

This exquisite collection will be issued *solely* for subscribers, with an absolute limit of one collection per subscriber. And the total number will be forever limited to the exact number of original subscriptions, postmarked not later than February 6, 1977. The collection will not be available after that time.

A deluxe collector's album included

Collectors who take advantage of this limited opportunity to acquire the Official First Day Covers of *The Queen's Silver Jubilee* will receive, without additional cost, a lavishly bound collector's album. To enhance the historical and educational value of the collection, an authoritative reference information will be included.

A convenient plan of acquisition

Each subscriber will receive the First Day Covers of *The Queen's Silver Jubilee* at the convenient rate of three per month, beginning in March, 1977, and concluding in early 1978. The original issue price of $3.25 per First Day Cover will be guaranteed for the entire collection. In view of the high denomination of the stamps, it is an exceptional value.

A collection for all seasons

A modern world which has split the atom and put man on the moon has found itself starved for the color, the romance, the chivalry, and most of all the sense of history which *The Queen's Silver Jubilee* Collection will preserve for the future. For you, and for future generations of your family, it will be a source of great satisfaction and inspiration.

Subscription Deadline: February 6, 1977

Please remember that this is the *only* time that this collection can ever be issued. To take advantage of this historic opportunity, postmark your application no later than February 6, 1977. Applications should be mailed directly to Fleetwood, 1 Unicover Center, Cheyenne, Wyoming 82008, under whose auspices the Society was established.

ADVANCE SUBSCRIPTION APPLICATION

The Queen's Silver Jubilee

Deadline for application: February 6, 1977.
Limit: One subscription per person.

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Cheyenne, Wyoming 82008 C2

Please accept my subscription for the Collection of Official First Day Covers of *The Queen's Silver Jubilee* issued by the Westminster Collectors Society. The collection will consist of approximately 42 flawlessly engraved First Day Covers which will be sent to me under protective cover at the rate of three per month beginning in late March, 1977. The total price of $3.25 per cover ($9.75 per month) is guaranteed for the entire collection. A handsomely designed collector's album will be sent to me at no additional cost.

☐ I enclose $9.75 for the first month's shipment. I will be billed for future shipments as they are made.

☐ Please charge $9.75 for each month's shipment to my credit card below at the time each shipment is made:
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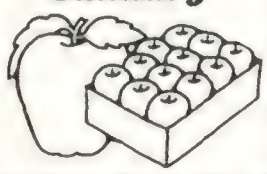
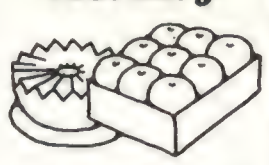
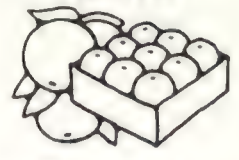
ROYAL RIVIERA® PEARS
America's rarest and finest fruit. So big and juicy you eat 'em with a spoon.
Net weight 6-3/4 lbs.

January

CRISP MOUNTAIN APPLES
Huge red rascals. Grown up here where the cold nights make 'em crackling crisp and juicy. Net weight 7-1/2 lbs.

February

ROYAL GRAPEFRUIT
Bigger'n grade A ostrich eggs, juicy as Oregon rain clouds, and so sweet they don't need sugar. Net weight 10 lbs.

March

ROYAL ORANGES
Juicy aristocrats descended from the fabulous Bahia oranges of Brazil. Sweet and tempting! Net wt. 5-1/2 lbs.

April

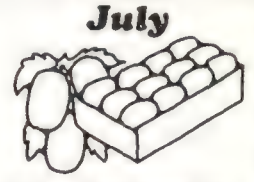
HAWAIIAN PINEAPPLES
Two hulapaloozers. Fully ripened the way mainlanders hardly ever taste 'em.
Net weight 9 lbs

May

WILD 'N RARE® PRESERVES
Our prize-winning homemade pure fruit preserves. No artificial flavors, colors, or preservatives. Four 3/4-lb. tins.

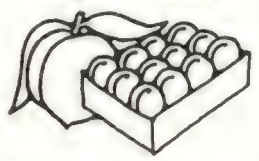
June

HOME-CANNED FRUIT
Uncanny! Orchard fresh, in extra-heavy syrup. Baked Pears, Summer Delight Pears and Oregold Peaches. No. 2-1/2 cans. Net wt. 5-1/2 lbs.

July

GIANT KIWI BERRIES
Wonderful new fruit from New Zealand. Delicate strawberry-banana-watermelon flavor. Rich in vitamin C, too.
Net weight 2-1/2 lbs.

August

EXOTIC NECTARINES
Plum peachy. Big and blushing. A sure-fire summer sensation . . . look good on the figure, too. Net weight 5 lbs.

September

OREGOLD® PEACHES
Family and friends'll never forget these huge Oregon beauties. We rush 'em harvest fresh. Net weight 6 lbs.

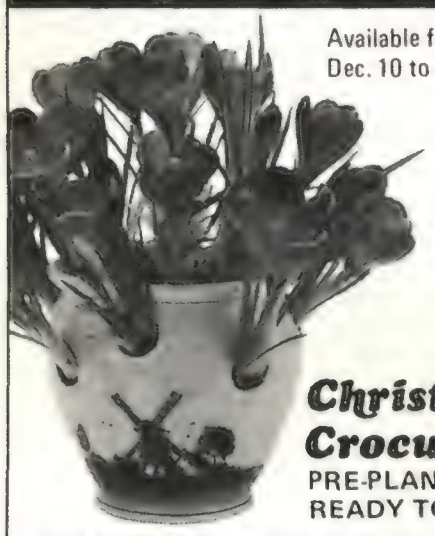
October

ALPHONSE LAVALLE GRAPES
Big, velvety black Belgian hothouse type. Make store-bought grapes look like birdshot! Net weight 4 lbs.

November

ROYAL BEURRE® BOSC PEARS
Smooth as butter, spicy sweet. We grow 'em here at Bear Creek where this extra-fancy fruit reaches its peak.
Net weight 6 lbs.

We guarantee your complete satisfaction — or your money back



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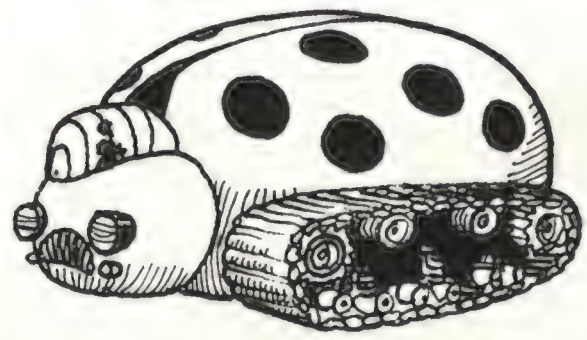
Phenomena, comment and notes

Science court could relieve politicians from public, language of Fido, and ladybirds aided by Britain's drought

The ladybug is one of the few universally beloved insects, but in the British Isles, where it is called a ladybird (SMITHSONIAN, February 1971), it almost lost its reputation this past summer. For with the drought came a huge infestation of ladybirds—they seemed larger as well as more numerous, and some people accused them of biting humans.

The phenomenon has been explained and Britons reassured by virtue of some excellent research of the sort that would be unlikely to happen on this side of the Atlantic. A few years back, an entomologist named Denis Owen simply set out to study the ladybird species that occurred in his suburban garden. There was no massive grant from the National Science Foundation, no elaborate apparatus adapted from the space program and no withering sarcasm from Congress, as might have occurred here.

Instead, Mr. Owen merely placed an ingenious trap in the garden and counted



Ladybirds not beloved in high numbers.

his quarry for several years. In the summer of the drought there was an increase in all but the most common ladybird, the one with two spots, and a dramatic, indeed overwhelming, increase in the seven-spot variety (which is larger than the two-spot).

The dry spring and early summer, Owen theorizes in the *New Scientist* (Volume 71, Number 1020), permitted the aphid population to boom, providing more fodder for ladybird larvae. Thus more ladybirds flew during the late summer. The large seven-spot seems more adaptable, more able to take advantage of the situation, just as some grasshoppers are able to exploit yet unknown situations and become locusts.

If it's dry again next year, the ladybird population will soar yet further, but Mr. Owen says not to worry, it's merely natural aphid control. Ladybirds do not bite: they excrete a liquid from their legs if disturbed while drinking (sweat, for example, from your skin). Some people are mildly sensitive to the liquid and feel bitten and betrayed. Best advice is to let the little beetle drink its fill and fly away home when it's ready.

Science olympics

Given a healthy prejudice against the more barbaric forms of athletics—ice hockey, for example—one leaps eagerly into *The Virginia Quarterly Review* (Volume 52, Number 4) where a humanities teacher, Burling Lowrey, discusses the dehumanization of sports in scholarly but no uncertain terms. It is worse than one might have thought (things usually are), but Mr. Lowrey goes too far when he compares the needs of the professional athlete to those of oppressed minorities or to women seeking dignity.

Athletes may be called jocks and other pejorative names, but a lot of them not only make a lot of money but choose to be athletes precisely in order to make a lot of money. It is similar to being asked to get up a lot of sympathy for the number of hours a wealthy banker must spend at the bank.

Furthermore, in their defense, sports give us a metaphor by which we can understand the complexities of the world around us. For example, we are told by our leaders that our nation's vigor (vis-à-vis guess who?) can be measured by the fact that we *swept* the 1976 Nobel Prizes

Children have always dreamed of running away to join the circus. And so it is with FunnyFace, captured in ruffles and greasepaint by the artists of Cybis.

FunnyFace dreams in porcelain, 10-1/2 inches tall. And he's just one of the inhabitants of the enchanted world of Cybis.

A world where carousel horses prance, baby owls practice wisdom, turtles live in jewelled houses, and flowers and children bloom forever.

Enter our world. Your dream is waiting there.

We're pleased to offer both the full-color introductory guide to the current Cybis Collection plus Crown Publishers' book "Poems for Children and Other People" illustrated with Cybis sculpture. For both, send $6.45 to Cybis ("See-bis") Porcelains at 65 Norman Avenue (SC), Trenton, New Jersey 08618.

©CYBIS 1976

in the same manner as the Reds wiped out the Yankees this year. And in the face of this headlined triumph, Americans may have overlooked a more subtle victory of Yankee science over Red science.

Soviet parapsychologists have for years been analyzing the "life force" they perceive in the varying patterns one can make by beaming an electric current through fingers placed on a photographic emulsion. Called Kirlean photography, it has excited many Americans. Now an American physicist, with the skill of a good defensive coach, and with the curiously symbolic name of Faust, has proved Kirlean photography to be bush-league science: the patterns vary not by virtue of any life force but simply by the amount of moisture on the fingers.

Judgment

This past autumn nuclear power came of age as a subject of electoral politics. Citizens of several states expressed themselves on the subject by voting for or against nuclear moratorium initiatives. In September the Swedish government changed hands, and the pro-nuclear prime minister Olaf Palme attributed his defeat primarily to the nuclear issue.

Now it has long been obvious that nuclear power was far too significant a matter to be left up to the experts, but it is not obvious that the answer is to turn it over to the general public to decide, when that general public is lucky if, on the average, it could pass a sixth-grade science test. This is not a new dilemma for democracies, but it is made worse by the increasing sophistication of our technological base.

I always drink Cuervo Gold. Now & then.

Try it on the rocks.

Cuervo Especial. Tastes somewhere between the smooth of scotch and the mellow of really good cognac.

When you're feeling a bit bored by your usual—try it on the rocks. If you're more bored than usual—try it in a snifter.

Of course, when you raise your glass, you'll also raise a few eyebrows. But surely you've done that before.

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When it comes to buying a 35mm SLR, foresight is less expensive than hindsight.

The time to find out what you need in a 35mm SLR is before you buy it, not after.

Because a camera that meets your needs is a good buy. And a camera that doesn't is a bad buy at any price.

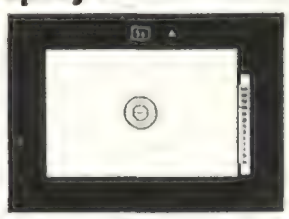
Know thyself. First of all, look ahead to what you'll want to do with the camera. Most manufacturers, including Minolta, offer a tempting array of features. To name a few: interchangeable finders and viewscreens, motorized film winding, self-timers, multiple-exposure capability and automatic exposure control. If you'll be using them, fine. If not, save yourself some money by cutting out the frills. Don't buy more camera than you need. Or less.

Match-needle or electronic auto-exposure? Minolta makes both kinds, so our only concern is that you get what's best for you.

A match-needle camera costs less. To set exposure, you line up two needles in the viewfinder. It's easy, fast and accurate, but you do the work. Minolta's match-needle models, the SR-T 200, the SR-T 201 and the SR-T 202, differ in price, according to their operating features.

Minolta's electronic automatic models are the professional XK, the deluxe XE-7 and the economical XE-5. In these cameras, shutter speeds are controlled electronically with unprecedented precision. Even if the light changes the instant before you shoot, the camera will set itself for correct exposure. Among Minolta electronic SLR's, you get a wide choice of features, including interchangeable viewfinders and focusing screens, shutter speeds to 1/2000th of a second, and multiple-exposure capability.

How much information should the viewfinder display? The more information in the viewfinder, the more you know about the technical details of how the camera is taking the picture. If this means a lot to you, pay the extra cost. If not, save some more money by getting a simpler model.



Minolta XE-7 viewfinder

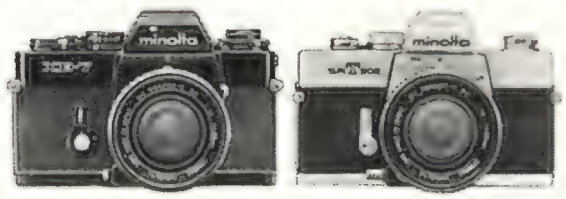
The important thing about Minolta SLR's is that in every single one, you can compose, focus, set exposure and shoot without ever looking away from the viewfinder. So you won't miss shots of even the fastest-moving subjects.

How does the camera feel and sound? This can tell you a lot about how well thought out the design is. A camera shouldn't take "getting used to." Your fingers should fall naturally and comfortably into place over the controls.

Advance the film wind lever. If a new camera has a "grainy" feeling, how will it feel after a couple of thousand shots?

How about noise? Close machine tolerances and careful damping of moving parts in Minolta cameras give you a noticeably smoother, more solid response when you push the shutter button. And Minolta's automatic SLR's have a newly designed electronic shutter that's a joy to hear because you almost can't hear it.

The lens system. You need a choice of lenses broad enough to meet your present and future needs. Minolta offers almost 40. From a 7.5mm "fisheye" to a 1600mm super-telephoto.



Minolta

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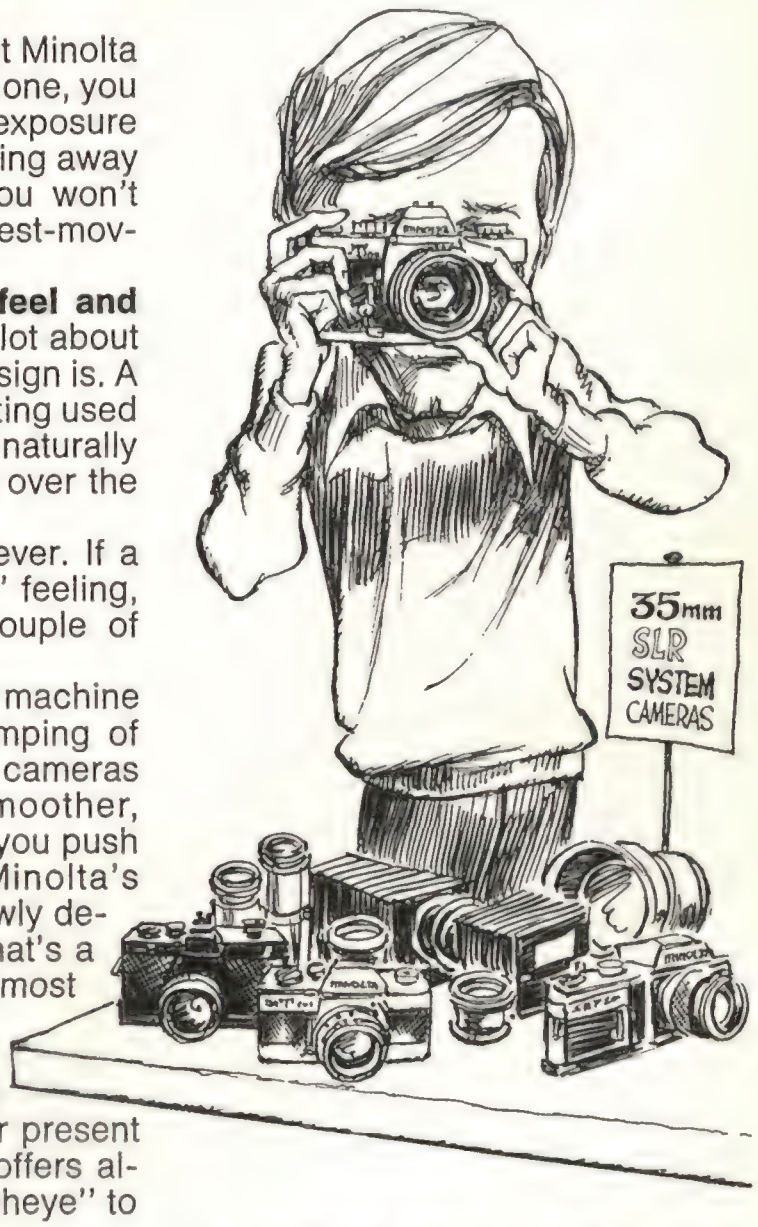

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What to do? The latest idea is the resurrection of an old idea, a science court, wherein a panel of scientific judges would hold formalized public hearings during which "case managers" would argue technological issues in the adversary manner. The science court was discussed last fall in a meeting of some 250 lawyers, scientists and bureaucrats, and the majority favored an experimental trial in spite of the idea's clear limitations—such as the problem that scientific questions often don't resolve themselves along either/or, guilty/not guilty lines.

The proponents hope that the court, nevertheless, might help to organize information more adequately for the eventual decision-makers, that is, politicians. On the other hand, if they could keep the sessions short and if they hired Perry Mason-types as "case managers," with a good science writer on the script, it could be aired in prime time and become a huge force for public education. Imagine: "SCIENCE COURT! Brought to you tonight through the joint sponsorship of General Motors and Common Cause. . . . Tonight, the Case of the Fluorocarbon Spray Can, with F. Lee Bailey arguing against Leon Jaworsky. . . ."

Awareness

It is a bit startling to realize that students of animal behavior, along with linguists, psychologists and philosophers, have for several generations been laboring under the certain conviction that Man is the only creature that is aware of itself, that has consciousness. To a dog owner whose dog is not only clearly aware of itself and a lot of other things besides, but also expresses its consciousness with far greater clarity than, say, a teen-age girl, this seems nonsense. But there are reasons for the mechanistic dogma and they are spelled out in a book, *The Question of Animal Awareness* by Donald R. Griffin (Rockefeller University Press). Dr. Griffin, by the way, is the gentleman who some time ago discovered that bats navigate by means of echolocation.

Linguists, naturally, think language is *the* unique thing about Man and believe that consciousness depends on language; ergo, no consciousness among animals. Behaviorists long ago decided that it was impossible to experiment scientifically with something so vague as old Fido's

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state of mind and took up the strategy of examining only those aspects of behavior that are quantifiable. Strategy soon evolved into dogma: what cannot be studied does not exist. Therefore no animal consciousness.

But now, Griffin asserts, we have learned enough about the complicated dance of the honeybee (whereby a worker "explains" by means of a dance in the hive where a good food source is) to know that bees have a very flexible, complex form of symbolic communication—what could be called a language. Also, a chimpanzee named Washoe can now carry on a complex conversation by means of sign language. These and other findings in animal communication lead Griffin to suggest to his colleagues that animals probably do have consciousness—even bees—and he neatly turns the mechanists' logic back upon itself. He suggests several ways of experimenting with the mental experiences of animals—such as building a "perfect" mechanical bee as a kind of spy in the hive, and disguising oneself cleverly as a chimpanzee.

The book will no doubt cause a flap in the scientific community. Because Griffin quotes liberally from his colleagues, it can also be recommended as an enjoyable primer on how sternly scientists speak to each other through the lofty medium of the scientific journal. Indeed, since it is written primarily for scientists, it is rather hard going in places, but it is blessedly short—105 pages. And, after all, if scientists are going to take the trouble to learn the languages of animals to probe their consciousness, isn't it incumbent on us laymen to struggle with the language of the scientists to see what sort of awareness *they* may have?

JAMES K. PAGE JR.

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By Don Moser

Dig they must, the Army Engineers, securing allies and acquiring enemies

The untroubled Tombigbee, an ecologist's and fisherman's paradise, soon to be inundated by the Tenn-Tom barge canal. Flooding and isolation have so far saved this part of the area.

The last thing I heard before going to sleep was the booming call of a barred owl, the swamp owl, as it hunted in the forest along the river. The first thing I saw when I opened my eyes in the morning was a pileated woodpecker, flying from one wooded bank of the river to the other in long, undulating swoops. In the Mississippi dawn we left our sleeping bags, munched down some granola, and slid the aluminum canoe into the river. As we started downstream, the Carolina wrens were singing themselves silly, the sounds preposterously larger than the birds that made them.

I was on Mississippi's Tombigbee River (the name is from Choctaw, perhaps meaning "coffin-maker") and my companion was Glenn Clemmer (p. 44), a young associate professor of zoology from Mississippi State University, who knows the river well and loves it. The Tombigbee is not a spectacular stream; there are no rapids, no plunging waterfalls, and the water itself is

First of two parts

Barge lock construction on the Tombigbee River is a current example of why 'they' are the developers that ecologists love to hate

Photographs by George Silk

E. L. "Pete" Travis, concrete inspector at Gainesville damsite, talks scheduling with a resident civil engineer. Mississippi State University activists and others are trying to stop this massive project.

turbid. It is an old river, meandering slowly through Southern hardwood forests. Periodically it floods out onto the adjacent flatlands, and this has served to keep human development at a distance. Shaggy cypress, sweet gums and a variety of oaks overhang its banks, and on this midsummer morning the trees were alive with birds, wrens and titmice and colorful prothonotary warblers.

We stopped once at a low, muddy bluff, where Clemmer scuffed up some relics from a hundred million years ago—tiny black sharks' teeth, perhaps a third of an inch long, like miniature obsidian arrowheads. A little farther on we beached the canoe again and Clemmer got out his seine. We dragged it along the bank for a few yards, then lifted it out. Tiny, shimmering fish lay in the meshes. Clemmer grabbed them up with quick movements of his hand and named them: killifish, little sunfish as bright as new coins, speckled dart-

Civil Engineer Charles R. Curren, Vicksburg experimental station, simulates wave erosion along California coast, only one of the hundreds of Engineer projects (see map, opposite page).

The Corps has asked Congress to de-authorize 400 obsolete projects, but some 600 (indicated by dots) from as far back as the 1940s are still on the active list. Critics want many more dropped.

ers and a catfish no longer than a tadpole, but with a charming name, frecklebelly madtom.

Later in the morning we rounded a bend and the river's character abruptly changed. Ahead of us the banks had been denuded except for a narrow fringe of trees, and up on the left bank we could see the crane-like neck of a dragline. There was a sign, too far away to read, but bearing an unmistakable symbol: the red castle of the U.S. Army Corps of Engineers.

Of all our institutions, none has had a more profound effect on the face of America than the Corps of Engineers. For decades the Corps has been dredging the nation's rivers and streams, building canals and waterways and locks and dams and flood-control projects. Today it is the largest civil-engineering outfit in the world. The Corps controls 25,000 miles of waterways, operates more than 400 dams and man-made lakes, and is the nation's largest single producer of hydroelectric power. Quite aside from its military construction, the Corps is building or waiting to build almost 600 civil-works projects across the nation. If completed, they would cost $33 billion.

Traditionally, the Corps has been beloved by Congressmen and local development interests because of the agency's ability to dispense huge barrels of pork, and at the same time despised by environmental groups, which have regarded it as a mindless destroyer of American land and water—an ecological Public Enemy Number One. A couple of years ago the American Rivers Conservation Council accused the Corps of perpetrating more than 60 crimes against the continent. The Corps, said the Council, was guilty of destroying parks and natural areas, damaging important caves, inundating archaeological sites, channelizing thousands of miles of natural streams in order to create flood-control projects which in fact make floods even worse, rigging cost-benefit ratios to make bad projects look good, functioning as a tool of the barge industry and other narrow special interests, building some dams in earthquake-prone areas and building other dams with such incompetence as to invite leaking or even collapse.

Don Moser has written a book on Central American jungles and wrote an article on a Smithsonian research outpost in the Panama Canal Zone, August 1975.

Glenn Clemmer, CLEAN leader, displays shovel-nosed sturgeon, one of several rare species threatened.

Such criticism notwithstanding, today the Corps has more power and a larger budget than ever. In 1972 Congress gave the Corps a major role in overseeing and protecting the nation's wetlands. Within the last year, under its new authority, the agency has made some decisions running against the historical grain. These decisions—against the interests of land developers and in favor of environmental protection—have astonished the Corps' friends and foes alike. To the surprise of just about everyone, environmental groups are now cautiously praising their historic adversary, while developers are trying to strip their traditional ally of its new authority.

Is the Corps undergoing a transformation, changing from an earth-moving agency to an environmental watchdog? To answer that question, one must look at the Corps both in its new function as a wetlands regulator (which will be the subject of the second part of this series) and its traditional job as a developer.

But first of all, what is this organization called the Corps of Engineers? As a military arm, the Corps has a long and honorable tradition. The Corps' motto is "Essayons" (Let Us Try), and try it has in war and peace. Corps battalions have built everything from barracks to Bailey bridges, from highways to seaports to airstrips, in every corner of the globe. In wartime the engineers frequently have put down their shovels and taken up their rifles to serve as auxiliary infantry. They often have been the first ashore in amphibious assaults, and when our side has retreated the engineers have been the last to go, blowing up roads and bridges under the guns of the advancing enemy. In peacetime, when a Corps assignment has offered the prospect of useful work rather than endless cycles of training, Corps commissions generally have been sought by the best and brightest graduates of West Point and other military schools, including Robert E. Lee.

The Corps has been involved in civil-works projects ever since the end of the Revolution, when it began building the new nation's roads and railways. Indeed, for the first quarter of the 19th century, West Point, then a Corps installation, was the only engineering school in the United States. In 1824 Congress gave the Corps the job of maintaining the navigation channels in the Mississippi and other rivers. After the disastrous floods of 1927 the Corps got into the national flood-control business and, when the Depression arrived, by logical extension of its existing role, the Corps took on the task of building dams and hydroelectric plants, in large part to provide work for the unemployed.

In its civil-works aspect, the Corps remains, at least superficially, a military organization. Its chain of command runs from the Secretary of the Army down through the Chief of Engineers—a lieutenant general—to major generals who supervise 11 regional offices, and finally to colonels in charge of the country's 36 Engineer Districts. But these officers and their small staffs are the only military men in civil works. All in all, fewer than 300 army officers command more than 35,000 career civil servants. The officers generally serve only three years on civil-works tours, and then rotate back to the Corps' military construction arm.

This system appears about as logical as putting an admiral in charge of the Fish and Wildlife Service. But the Engineers defend the odd structure with some logic: an army officer on a short tour, they argue, is not so apt to become a partisan of a particular project as a bureaucrat who has lived in a community for 20 years. The officer has no vested interest and can consider a project on its merits. Furthermore, in times of changing national policy—such as the one we have been going through lately—a military man is by training highly responsive to the chain of command, and not likely to indulge in bureaucratic foot-dragging. Many

The mussel *Megalonaias,* a favorite of naturalists, known locally and with reason as the giant washboard.

environmentalists agree with this assessment, giving the generals and colonels at least passing marks for flexibility, and saving their real rancor for the Corps' high-level civil servants.

Ever since the late 1960s, groups such as the Environmental Policy Center, the Environmental Defense Fund and the Natural Resources Defense Council have been chipping away at the Corps with growing effectiveness. Although often accused of being emotional, such organizations play a hard-boiled, pragmatic game these days, attacking Corps projects with blizzards of economic analyses, ecological studies and legal injunctions. As a result, many Corps projects with a strong odor of pork have been stalled or abandoned.

One of the Corps' most active antagonists is Brent Blackwelder of the Washington-based Environmental Policy Center. "Today we can clobber them on new projects which are poorly conceived," says Blackwelder. "The problem is with all the old boondoggles authorized by Congress back in the Forties and Fifties, which are still not built. The Corps clings to them like a bulldog. These projects never die, they just fall into a coma for a while, then get revived. Our fight now is with all these old dogs."

Of all the projects that Blackwelder and his allies consider "old dogs," by far the biggest and most costly is the Tennessee-Tombigbee Waterway. The waterway is too huge, with effects too far-reaching, to be considered a typical Corps project. But an examination of the Tenn-Tom, as it is informally known, reveals a good deal about the Corps' civil-works operations.

The Tenn-Tom will connect the north-flowing Tennessee River to Mobile, Alabama, by turning the upper Tombigbee into a 253-mile-long barge canal. It will thus provide a water transportation route directly to

"You can float for a couple days, not see a soul," says Bob Carter, displaying a splendid catfish.

This clump of cardinal flowers will soon give way to the inexorable forces of growth, profit and progress.

Fossil sharks' teeth of the Cretaceous period 100 million years ago, dug up from Tombigbee's banks.

Solid lines indicate navigable rivers and existing waterways. Broken line is to be the Tenn-Tom link.

Massive landfills near divide cut may produce heavy erosion, destroy habitat and conceal Indian sites.

the Gulf (see above), shortening the trip for barges, which otherwise would go via the Mississippi, by some 800 miles. The project will include five major dams and ten locks, creating a chain of flat-water lakes in the river's old channel, and digging a 27-mile trench through the hills that separate the Tombigbee River from the Tennessee. This trench alone will require the moving of 150 million cubic yards of earth, more than was taken from the divide cut of the Panama Canal.

Whether a dog or not, the Tenn-Tom is certainly old. In 1760 General Montcalm urged the idea on Louis XV of France as a key to promoting settlement of the Southeast. Tennesseans lobbied for the canal more than 150 years ago because they felt it would be "great for trade." Congress first authorized its construction in 1946, when the cost was expected to be about $120 million. Construction actually did not begin until 1972, when costs were predicted at $390 million. In the four years since, the costs have quadrupled to between $1.6 and $1.8 billion. By the time the project is finished in 1985, inflation certainly will drive the bill much higher. The most direct beneficiaries of the waterway will be shippers of bulk commodities such as coal and grain, along with the barge industry itself, which will pay no user fees whatsoever.

To most environmental groups, the Tenn-Tom is a disaster. The waterway's opponents feel that the government should spend its money on the railroads, which are already so run-down as to require federal assistance, instead of subsidizing a competing form of transportation. The Tenn-Tom's most determined adversary is Clemmer, my canoeing companion on the river. Clemmer and a few others, most of them connected with Mississippi State University, are fighting the project through an organization called CLEAN—Committee for Leaving the Environment of America Natural. Although the project is well under way, with one set of locks and a dam virtually complete and others under construction, CLEAN shows no signs of giving up. Annually the Corps must go back to Congress to request funds for the coming year's construction. CLEAN hopes to block next year's appropriation and thus leave the Tenn-Tom stranded.

Clemmer is an ichthyologist. He spends much of his time up to his knees in the river, studying its fish. "There are a 115 species of fish in the Tombigbee system," he told me. "In terms of fish life, it's got the second richest fauna of any river in the United States. That makes for a great biological laboratory. Some rare species won't survive once the Corps changes the river." He went on to talk about some of the other losses. Six hundred archaeological sites will be affected by impoundments. Forty thousand acres of hardwood forest and much wildlife will be lost. At the divide cut,

Critics provided the irony in sign that Corps erected beside a demolished bridge (see also p. 48).

the engineers have no place to put the millions of cubic yards of earth they will remove, so they plan to dump it, up to 80 feet deep, in 43 sites adjacent to the upper river. The cut itself may create problems with the local water table, and the bank-clearing associated with the project is apt to increase erosion and flooding downstream. "The Corps talks about putting in recreation facilities," Clemmer said. "They've just channelized a tributary of the Tombigbee for a flood-control project. It was one of the loveliest streams around here, and they've denuded the banks of trees. When I asked them about shade, they said they'd put up concrete pavilions. This whole project will encourage more development of the floodplain, and then when the floods do come the people will ask for federal disaster relief."

But the waterway has its advocates, plenty of them. The Corps has neither the authority nor the money to carry out civil-works projects on its own. In order to be considered by Congress, a Corps project must rally support from three parties. First, the project must have a sponsor, an interested party such as a group of farmers or chamber of commerce, which believes the project will be beneficial. The second is a local Congressman or Congressmen, without whose backing a new project has no chance whatsoever. The final supporter is the Corps' District Engineer, who must recommend that the project is feasible and worthwhile.

In the case of a huge interstate project like the Tenn-Tom, the sponsorship leg is a very sturdy one, encompassing a wide variety of industrial, transportation, agricultural and commercial interests both in the Southern states where the waterway will be built, and in the Midwestern states which it will ultimately serve. Officially, sponsorship is embodied in the Tennessee-Tombigbee Waterway Development Authority, a promotional and coordinating organization established by the five Southern states that are the most directly affected: Tennessee, Kentucky, Mississippi, Alabama and Florida.

The administrator of the Authority is Glover Wilkins, a tall, silver-haired Mississippian with a honey-dipped voice and the smooth charm of a Chamber of Commerce president, which he once was. When I visited him in his offices in Columbus, Mississippi, Wilkins was eager to talk about the benefits which would flow to the whole region once the Corps finished re-creating the "snake-infested, unimproved" Tombigbee River. "This is going to benefit 23 states," he said. "It will cause an industrial revolution in the South and in middle America. For everything that moves over the waterway there will be an average savings of $2.29 a ton, and these are savings to the consumer. The energy crunch will be solved by our ability to move coal. Grain for export is one of the big things that will move on the waterway. We need this project to feed a starving world."

When I turned to some of the environmental and economic objections raised by Clemmer and other opponents of the project, Wilkins seemed annoyed that such questions were still being asked. "You could nit-pick this thing all day," he said. "It's been discussed

Collapsed railroad bridge in construction area is readied for coup de grace by Corps demolition experts.

and rediscussed. There are no new arguments. The thing now is to *build the waterway.*"

The second supporting leg for the Tenn-Tom, the Congressional leg, is a sturdy one as well. To become a reality, a Corps project must be authorized by the public works committees of both houses, then funded by the appropriations committees. Key members of these committees are powerful Southern Senators and Congressmen, and their interest in the Tenn-Tom is evident. One of the project's firmest supporters is Congressman Jamie Whitten, ranking member of the House Appropriations Committee, who represents the northeastern Mississippi district in which much of the project will be built. Although his views are anathema to environmentalists, Whitten considers himself a true conservationist, and has a long record as an advocate of reforestation, land reclamation, agricultural development, flood-control work and the TVA.

During hearings on the project Whitten told one of the waterway's opponents: "If our forefathers had your viewpoints, we'd probably be wearing loincloths today." When I interviewed him, he was equally blunt about environmental groups. "Some groups are against change in the environment, even improvements. They would fix it to where we'll starve to death, if you listen to those who are fanatical about it. I've been in practically all these worn-out countries of the world. You just travel over South and Central America and think about what we'd have been if we'd let our country stay like that without development." In his committee posts, Whitten has passed judgment on many Corps projects over the years. Did any of them strike him as being pork? "It may be pork in the mouths of the American people," he said, "where otherwise they'd go hungry."

No Corps project can get funded without a cost-benefit analysis. This is a weighing of all anticipated costs of a project against all the anticipated benefits. A project should achieve at least "unity"—a dollar back for every dollar spent—before the Corps will recommend it. The Corps' antagonists claim that such analyses illustrate an old academic axiom: the questions you ask determine the answers you get.

The Tenn-Tom, in its basic form, has a cost-benefit ratio of 1 to 1.08—that is, for every dollar spent, a dollar and eight cents returned. Most of the dollar benefit is from navigation, reflecting a saving for goods shipped via the Tenn-Tom. But 21 percent of the overall dollar benefit will come from savings on the shipment of coal for export, primarily to Japan. Is this, environmentalists ask, consistent with a policy of energy self-sufficiency? Moreover, some $6.9 million in annual benefits are claimed for recreational use of the Tenn-Tom's man-made lakes, picnic grounds, nature trails and campsites. Such slack-water impoundments are certainly popular in the South, especially among water skiers and dedicated bass fishermen, who customarily use high-powered boats. But a great many of the people in the Tenn-Tom region are blacks, most of them rural and poor. It has been suggested therefore that this benefit is really a federal subsidy to affluent Southern whites.

One may also consider the Corps' projections of future demand in calculating recreational benefits. In the year 2035 a 9,000-acre lake to be created at Columbus, Mississippi, is projected to have 29,000 visitors on a summer Sunday. Of these, 8,000 will be fishermen, a density over the entire lake of almost one fisherman per acre. During the same summer Sunday, the lake

will be used by a total of 4,200 boaters and 4,200 swimmers. On the assumption that the fishermen will require 2,500 boats and the boaters at least another thousand, the resulting traffic jam boggles the mind. When it was suggested to a Corps official that the projection seemed incredible, he said: "Sure it would be crowded, but we can see where it would be possible."

The Corps credits the project with an annual benefit of $15 million for area redevelopment—that is, in wages and economic stimulation in depressed counties nearby. But just who is getting these dollars? Some of the counties along the waterway have populations that are 60 to 70 percent black, and the Corps has fallen far short of giving rural blacks an equal slice of the benefit pie. However, the Corps recently has set a new goal of 30 percent for minority-group employment by 1980. The Corps claims another $197,000 in benefits to fish and wildlife. While acknowledging that habitat for upland creatures and some fish will be lost through flooding, the Corps says that this loss will be more than offset by the improvement of habitat for largemouth bass and the creation of some additional space for migratory waterfowl. The very idea outrages people like Glenn Clemmer, who thinks it absurd to disrupt a natural, diverse system like the Tombigbee and call the result a plus for fish and game.

Moreover, the Tenn-Tom, like a number of old projects, is protected by a legislative grandfather clause; the Corps is charged only 3.25 percent interest on the money it spends—a rate for nobody else, anywhere.

Was the cost-benefit ratio juggled?

A $200 million surprise appeared earlier this year when the Corps concluded that the capacity of existing locks and channels on the lower Tombigbee was insufficient to handle the traffic load coming down the new waterway. It was decided that parallel locks should be built at a cost of $113 million, and channels enlarged. The Corps says it always knew the capacity of existing locks would have to be increased someday, but rising demand now requires the work sooner rather than later. Interestingly enough, though, this decision was reached just as swelling construction costs dropped the Tenn-Tom's cost-benefit ratio to a bare 1 to 1.08, and the additional work on the lower river, by increasing capacity, would raise that to a healthy 1 to 1.3. Thus the project's opponents have suggested that the Corps simply juggled its studies until it found means to keep the waterway looking viable.

What of the Corps itself, that vital third leg of support? The primary responsibility for building the waterway rests with the Corps district headquarters in Mobile, Alabama, where today the words "environment" and "ecology" are on everyone's lips. Colonel

Tracks will be shifted to scarred area, right.
Canal will be dug on present location of railroad.

Charlie Blalock, the district engineer, is well aware of the new image the Corps is striving for. When I visited him, he told me that over the weekend he was going bird watching with a local member of the Audubon Society, hardly the way one might envision a Corps officer spending his spare time. "The Corps is more environmentally conscious than any other federal agency around," Blalock said. "If I were going to err, I'd err on the side of the environment. But I do think the Tenn-Tom is a good project. It's economically sound. I don't think its environmental impacts outweigh its advantages to the country."

Certainly after listening to Corps people one does sense that the Corps is paying more attention to environmental considerations than it ever has before. Once committed to a new project, the Corps spends a lot of time and money trying to minimize impact. On the Tenn-Tom the Corps has relocated a dam in order to preserve an archaeological site, altered spillways to maintain water quality and commissioned studies to find ways of vegetating dredge spoil.

Yet one can't help sensing a certain ambivalence here—a change of procedures perhaps, but no corresponding change in values. When I asked Colonel Blalock about the esthetic value of the undisturbed Tombigbee, and why that is not counted as a loss in the cost-benefit analysis, he replied: "It is a whale of a subjective thing. What is it worth to someone who likes to walk through the trees if you cut them down?" True enough. But the environmental impact statement, which the Corps must now prepare for every major project, dismisses the intrinsic value of the river with a single sentence: "The overall project area is one of scenic attractiveness."

One senses the same ambivalence in the Corps' headquarters in Washington. The man who runs the Corps, the Chief of Engineers, is Lieutenant General John Morris, who in his long career has served in virtually every echelon of the Corps' civil-works organization. When I showed up in his office, he whipped from his desk drawer a big button bearing the words "The Corps Cares." "You aren't going to get out of this office without one of these," he said with a grin. "We have reviewed a lot of our backlog of old projects, and we've recommended that more than 400 of them be de-authorized. We've modified hundreds of other projects. . . . Today dams are the last acceptable answer for flood

Excavation continues around the clock to complete construction of dam and locks at Aliceville, Alabama.

control. We look for other answers first—moving people off the floodplain, making minor diversions, waterproofing structures, flood insurance." As for the Tenn-Tom, that's another story. "I believe the nation deserves a first-class water transportation system," he said. "And this has to be done by the federal government." In the end, whether the Tenn-Tom is a boon or a boondoggle depends on where you stand. The project's impact and its economics are so complex and the "facts" so contradictory that one can reach only two conclusions with any certainty. First, the waterway will eventually become a heavily used transportation corridor, and it will generate some additional economic development in the region. Second, even if environmental damage can be minimized, the project will permanently destroy a lovely natural river. Thus, if one thinks that the nation's first priority is to maximize development, the Tenn-Tom may be worthwhile in the very long run, even though its short-term economics look shaky. But if one feels that our top priority today should be to keep our remaining free-flowing streams in a natural state, altering them only when necessary, then the waterway is clearly undesirable.

Where the Corps stands today is, by and large, where it has always stood: with those whose priority is growth and development. "We have changed our direction, but we haven't changed our philosophy," said General Morris. The Corps may dig less, and more responsibly, than in the past. But dig it must.

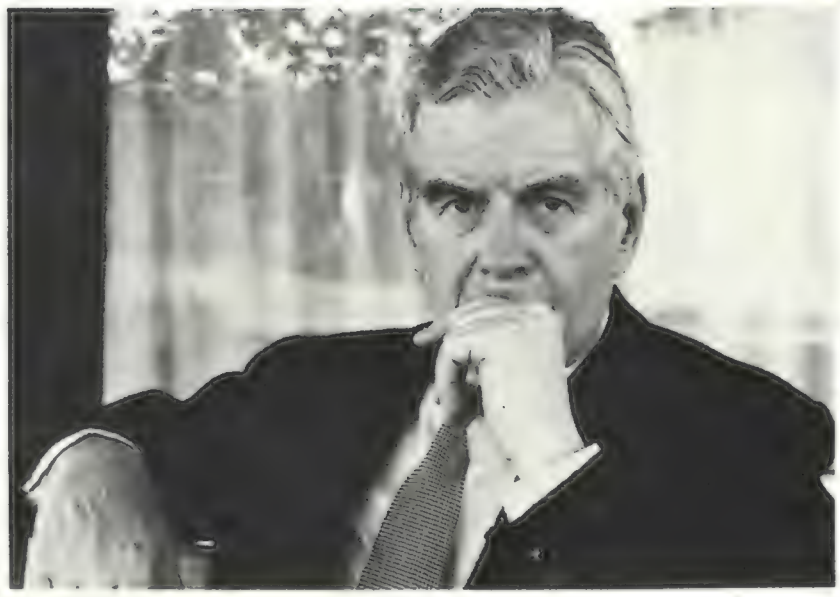
Next month: A bow to the environment

By Keith Wheeler

Lighthearted view of serious air history: by Osborn, natch

Osborn's flying career ended in what was called the "yellow peril." The "teacher" couldn't learn.

Robert Osborn fought World War II at drawing board, as shown by the great photographer Edward Steichen. Modern picture at right is by his wife, Elodie.



If you were a Navy pilot, you may owe your life to the man whose training posters brought you Dilbert, Grampaw Pettibone and Spoiler

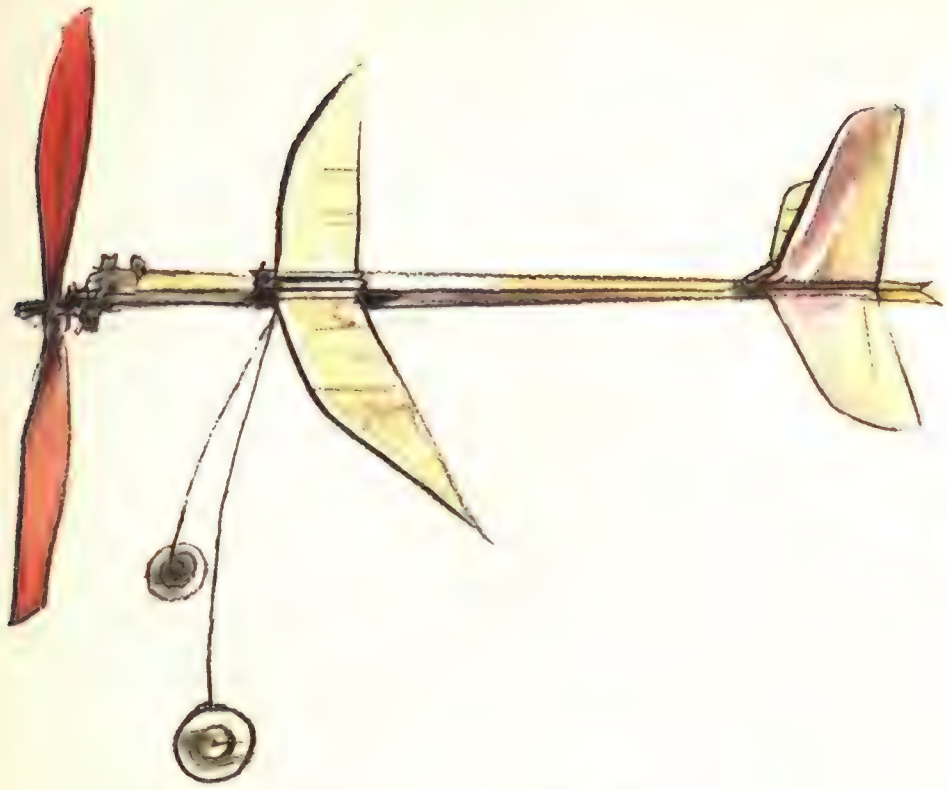
Dilbert, the dumb cadet, trots to his plane with fatuous smile and empty head. In minutes he will be in deep trouble because of some stupidity that trainee viewers will recognize.

On a Saturday in the summer of 1914, when Robert Osborn was in his tenth year, word reached Oshkosh, Wisconsin, that an aviator had landed at Appleton with an airplane and proposed there to demonstrate the marvel of manned flight the next day. Sunday morning, acceding to the urgent appeals of his sons Robert and Chandler, Albert Osborn cranked the family Packard and drove the 20 miles up the shore of Lake Winnebago to the scene.

Today, more than six decades later, that scene remains clear in Robert Osborn's memory. There came a chattering sound from a neighboring field, hidden by a grove of oak. The noise swelled to a sputtering roar and then, above the trees, an apparition slowly came into view—a Curtiss pusher, as open to the wind as a hayrack, seeming almost gauzy in the flexing of its slender spars and struts.

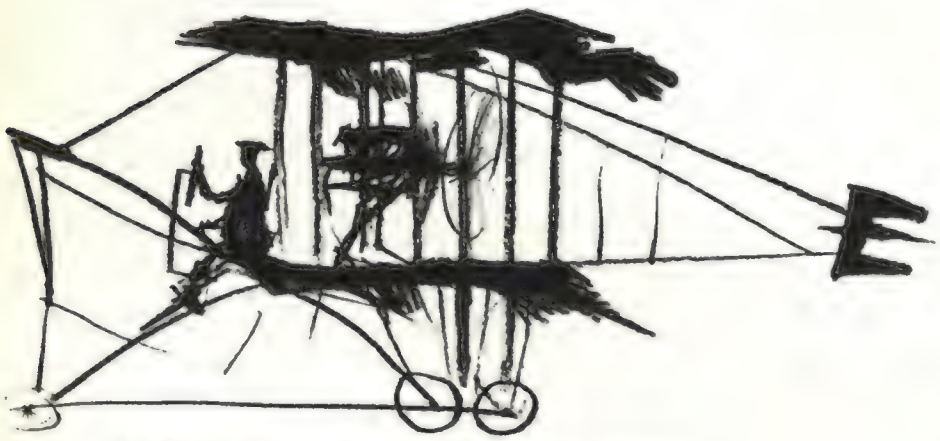
"It went quavering by at an altitude of probably 75 feet," Osborn remembers. It then gingerly circled the fairground, landed, and the pilot, a lordly creature out of another world, dismounted to shake hands with

Choleric with rage, Grampaw Pettibone, an ancient (hence very careful) pilot, advances on Dilbert and the reader to drive home a lesson and thus salvage another young life.



Osborn's involvement with the Blériot included building this ill-fated flying model.

The fledgling: a species that the artist has for years struggled to preserve.



The first plane that Osborn saw nearby was a Curtiss pusher in 1914, here recollected.

Blériot monoplane, type that crossed English Channel, crashed in front of 11-year-old Robert.

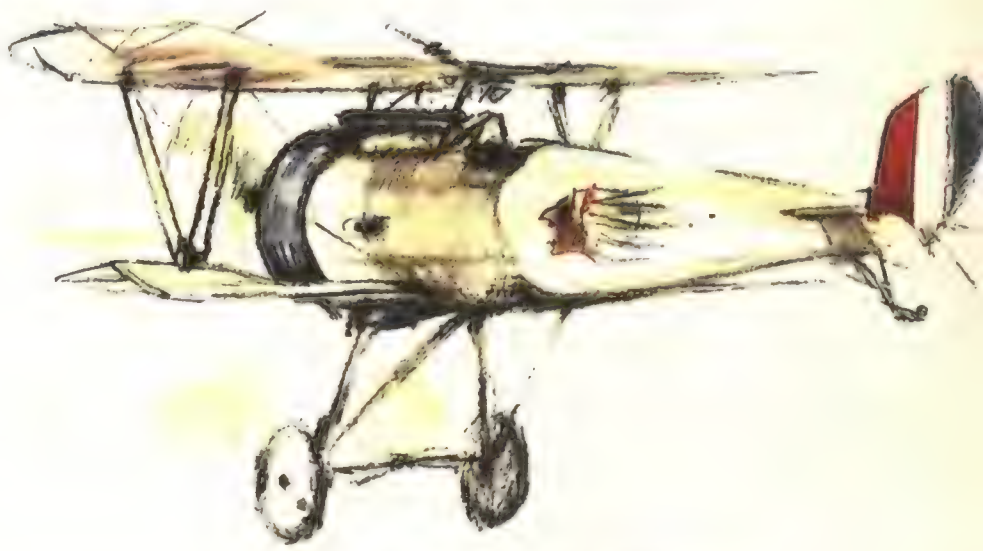
the mayor and other notables as the band played. Spectators helped turn the machine around, the engine was cranked and the trembling contraption was held by its wing tips until the pilot remounted, signaled for his release and took off at what Osborn thought might be fully 40 miles an hour.

"It was a matter of absolute, total fascination," he remembers. "The thing was that it *looked* like something that *could* fly." This was the beginning of a lifelong and tender—on his part, almost totally faithful but not quite requited—love affair between Osborn and any machine man can make that will lift off the ground and fly.

Many years later, and by a series of not entirely logical steps, this emotional commitment led to a legend that in World War II he, a cartoonist by trade, was the man who taught U.S. Navy aviators how to fly. Osborn rejects the theory. He says that in the long run the Navy taught *him* how *not* to fly. Nevertheless, many old Naval aviators still testify that he helped them keep their necks and their expensive aircraft in flying condition.

Osborn's second early contact with flying machines,

World War I triplane of Baron von Richthofen's Flying Circus seemed all wings and bullets.



Dainty Nieuport fighter of Lafayette Escadrille had a jaunty look that the artist still loves.

about a year after meeting the Curtiss pusher, turned out to be tragic. An aviator named Niles came to Oshkosh, bringing along a Blériot monoplane dismantled on a flatcar. This slender machine, with wings as diaphanous as a dragonfly's, was sister to the famous plane in which Louis Blériot had crossed the English Channel in 1909—the first person to do so in a heavier-than-air machine.

Then that afternoon the Blériot took off. And as it began to circle overhead at about 1,000 feet, the right wing simply came off.

"The wing came down like nothing so much as one of those winged seeds, spinning slowly while the fuselage and the pilot plummeted to earth. As for Niles, I'm damned if the people didn't even pull off his cufflinks. That should have finished me, but it didn't."

The artist's work is synonymous with joy. He illustrated our first article in our first issue in which an upbeat René Dubos described the keystone of SMITHSONIAN'S *policy. In October 1971, Osborn drew a cover simply called "pleasure." Wheeler wrote about John Stevens in October.*

Osborn's next Blériot was a three-foot rubber-powered model. It came in a box under the Christmas tree when he was 13 years old. It took him perhaps 30 delirious hours to glue and wire the structure together, install the rubber band and cover the wings with translucent blue silk, but when it was finished it was as beautiful as the machine in which Niles had died. And it came to a similar end. Assembled, with the motor wound tight, the Blériot was launched by its young builder on the lawn before parents and friends. It flew 13 feet, pulled up, stalled and spun in. "It looked like kindling for a Boy Scout's fire," says Osborn.

So far, Osborn's affair with aircraft had proved more esthetic than participatory, more platonic than con-

Post-World War I flying boats such as this one pioneered both Atlantic and Pacific Oceans.

summated. He loved them for their beauty, their fragility, the knowledge that they *could* fly. By then he was admiring the light, graceful fighter planes of the Great War: French Nieuports and Spads, British Sopwith Camels and S.E. 5As, German Fokkers and Albatroses. They seemed more jaunty than things meant to kill. The French planes, especially, had lines that evoked a peculiarly Gallic beauty.

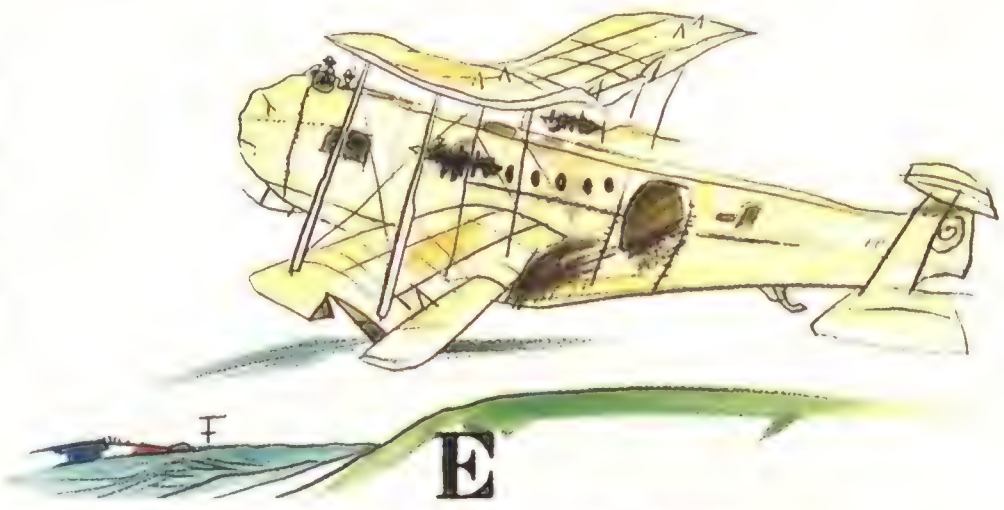
Osborn has a pretty clear idea of why he, the son of a northern Wisconsin timberman, wanted to become an artist while his brother Chandler turned toward economics. He lays the responsibility mostly on his mother, but partly on his father for having a difference of opinion with President Theodore Roosevelt.

Albert Osborn and two business partners saw an opportunity to corner all the hemlock timber in northern Wisconsin. They were well along toward doing so when T.R. intervened. It was the era of Teddy's trust-busting, and the elder Osborn's hemlock corner was suddenly described as an evil business practice. After lengthy proceedings, the partners were forced to divest. The litigation involved the use of ream upon ream of excellent paper in many colors and, when the proceedings ended at last—with the trust busted—the Osborn attic was still heavy with thousands of sheets of unlined, unscarred, unused paper. If a lad felt like drawing pictures, he had an endless supply of material.

Osborn's mother's part in all this was a little more profound. As a very young woman she had come from Detroit to teach music in Ironwood, Michigan. Across the state line was Hurley, Wisconsin, the toughest timber town on the coast of Lake Superior. There she wed Albert Osborn, and they soon established their home in the somewhat less turbulent Oshkosh.

Robert Osborn remembers his mother as an ebullient woman, gracious, strong of character, good-humored, who saw to it that her children were provided with food for the imagination. Osborn still cherishes some of his childhood books, illustrated by such artists as Beatrix Potter, Arthur Rackham, Peter Newell, Palmer Cox and Kate Greenaway. His mother kept Robert plentifully supplied with pencils and watercolors with which to work at consuming his father's over-supply of trust-busted paper.

Osborn himself was diligent about whittling down those piles of foolscap. At five or six he showed an inherent knack for telling caricature and satire. Yet about 40 years elapsed before Osborn recognized this knack for the cartoon as his true talent. Through all those years he pursued the goal of becoming another Cézanne. The pilgrimage cost him spiritual pain and ultimately a virulent set of ulcers.



Early British transports made pioneering pay by wobbling from England (E) to tricolored France.

It started in 1924 when he left the University of Wisconsin and went to Yale. There he majored in English, but longed to take courses at the Art School. Getting enrolled in it was difficult, so in the meantime he drew cartoons for the *Yale Record* and *Yale Daily News*. Finally, the dean admitted him to a drawing class, a possible two-hour credit.

"For the first week we drew a plain plaster head—just the shape of it. We drew it again and again until the paper turned brown from erasing and redrawing. I hoped and expected that the next week was going to take us into figure drawing. But when the week began, the professor had us back to drawing that plain oval egg. And so, lacking humility, I drew a face on it. The professor passed by and looked at it and said, 'Young man, what is that?' I said, 'That is George Bernard Shaw, sir.' 'Young man,' he replied, 'I am afraid you are not our type. You may depart.' "

Osborn's wounds might have been soothed had he known that one of his predecessors in that famous school, some decades earlier, had had a similar experience. Frederic Remington, the country's most famous artist of the Wild West, sometimes complained that the

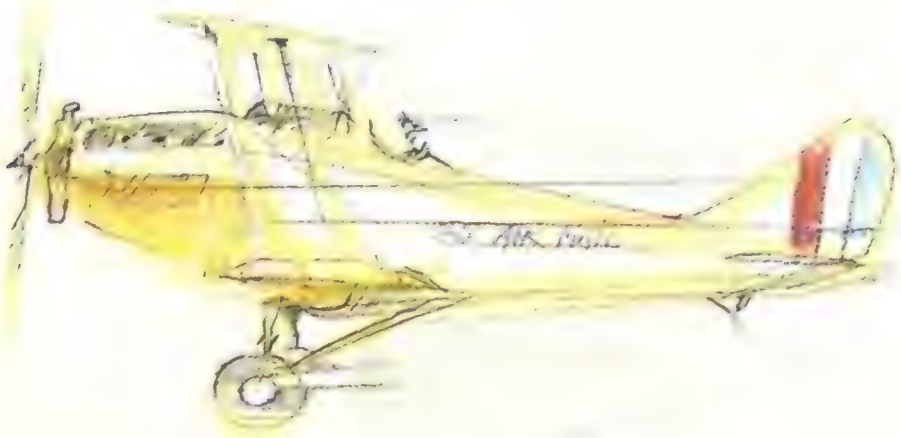
only thing the Yale Art School ever taught him was "how to draw a straight line."

In 1928, with $1,050 in his pocket and hope in his heart, Osborn set out for the art classes of Europe. That first trip led him to his first head-to-head encounter with an airplane. Wearing a new English suit with plus fours and a cap to match, he flew across the Channel from Croydon, outside London, to Le Bourget, outside Paris, in a reconditioned Handley Page night bomber, left over from World War I. It made the crossing at around 400 feet. The flight confirmed Osborn's boyhood belief that aircraft were among the finest works of Man.

"I was living on about $500 a year and getting dexterous, but I was painting a gallery of false, sleazy Cézannes and then Renoirs—anything but Osborn."

As the money ran out, he had a stroke of luck. Through a Yale friend he was offered a job teaching art at Hotchkiss, a private school in Salisbury, Connecticut. He reached New York with enough cash to buy a coach ticket, slept that night on a bench in Grand Central—periodically being tapped awake by the nightstick of a cop who wanted to know if he really had a ticket—and so began a five-year career.

He had not yet, however, entirely got over thinking of himself as an unfulfilled Rembrandt. In 1935 he



In the 1920s, U.S. Army fliers took over airmail in open-cockpit biplanes such as this one.

went back to Europe to "be a painter." The effort was a cumulative disaster.

"My paintings kept getting smaller and smaller until most were barely six inches across. I think I wanted to control the world I was trying to work in instead of letting my subconscious play its necessary role. Psychologically I was coming apart."

Through a friend who was involved with Carl Gustav Jung, he got an idea that the Swiss psychiatrist might help him. He wrote to Jung and, somewhat to his surprise, Jung wrote a gracious reply. Altogether, they exchanged three letters. As well as Osborn can remember, Jung didn't recommend anything specific but did make some sympathetic suggestions about things that might happen if Osborn would try one thing or another. Rather unaccountably, the correspondence made him feel better.

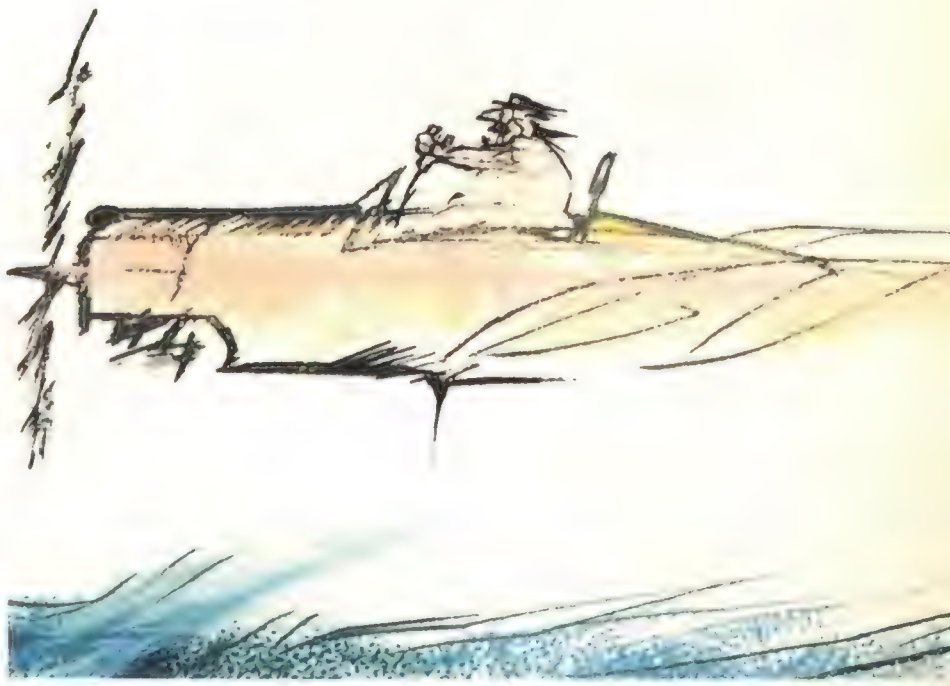
"I finally admitted to myself that I was no Cézanne." But if he wasn't an artist, what in heaven's name was he? Trying for an answer he wrote on his wall, "Look into becoming a *GREAT* cartoonist."

In 1938, he went home to do so. From time to time he sold a drawing or painting, but his success was less than spectacular. Then a friend invited him to go duck hunting. Osborn, who had always been good with a shotgun, accepted with enthusiasm, and afterward *drew* his friend a letter of thanks. Osborn seldom writes a letter—he prefers to draw it. This one became a series of sketches recounting the day's shooting.

The friend was so captivated by Osborn's pictorial account that he began showing it to other friends. One showed it to an editor at Coward McCann. The next thing Osborn knew, he was the author of a picture book called *How to Shoot Ducks.* And the *next* thing he knew was that it sold 40,000 copies the first year!

Coward McCann, recognizing a good thing, asked for more books like *How to Shoot Quail* and *How to Catch Trout.* So, for the first time, Osborn began to make money. Over the years his work began appearing in such magazines as *Life, Fortune, Look, Harper's, Esquire* and, above all, *The New Republic.* "I now knew," he says, "that I had the ability to transpose the way an action, a mood, a thing *feels.*"

Thus pursuing the *feel* of things, Osborn made the first drawing ever used as a *Life* cover. It illuminated the agonies of the hangover, and Osborn expressed



Float planes were great over watery areas—except when something happened to the float!

The Spoiler, a banana-fingered mechanic, was another villain of the World War II posters.

the feeling simply: a man with a nail through his head. The sculptor Alexander Calder (see p. 74) later made him a nail which he could snap into both ears.

By the late Thirties he had witnessed both Mussolini and Hitler in action. It was obvious that these were evil men and that somebody would have to destroy them.

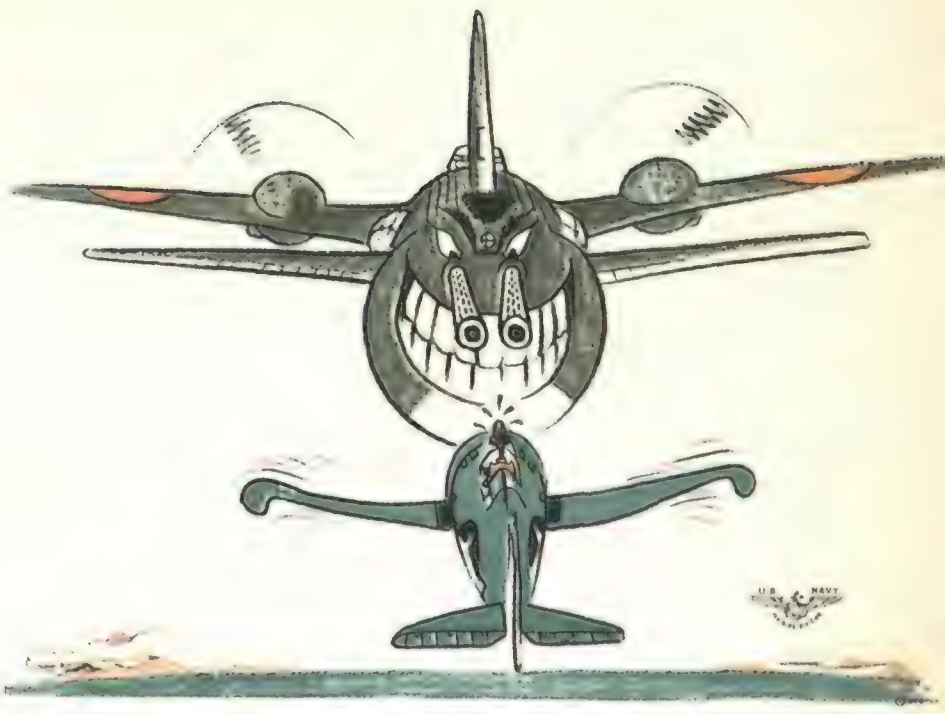
From Connecticut, Osborn went to Boston and tried to enlist in the United States Army, but the Army was averse to taking on a case of galloping ulcers. The Royal Canadian Air Force felt much the same and sent him home. So he helped raise and can 14 tons of tomatoes and shipped them to London.

Then came Pearl Harbor. The next day he was at the local post office, trying to enlist in the Navy. He was shuttled from Manhattan to New Haven and then inevitably back home to Salisbury, Connecticut. A friend suggested the Bureau of Naval Aviation. That struck a chord: airplanes. Even with ulcers, Osborn might paint camouflage.

He went to Washington and plodded through the bureaucracy until he encountered a training division officer who looked at the portfolio he had brought along. This man sent him along to see a bluff, hearty, hard-drinking Navy aviator, Commander A. K. (Artie) Doyle, who was trying to put together training devices to keep fledgling cadets from killing themselves.

Osborn found Doyle and a Captain Arthur Radford, both later to become distinguished carrier admirals, at adjacent desks for which they had no chairs. (Radford ended his career as Chairman of the Joint Chiefs of Staff.) They had solved this problem by rigging a plank across the pulled-out lower drawers of the desks. Doyle, who had some familiarity with Royal Air Force training manuals, immediately saw in Osborn a possible solution to the problem of student pilots wrecking themselves and their planes because of dumb mistakes.

With Doyle at his elbow, Osborn invented a cast of cartoon characters: "Spoiler," an aviation mechanic



This wartime poster warns fighter pilots not to level off right behind a Japanese bomber.

Here Dilbert misreads the signals of the deck landing officer of an aircraft carrier.

and a worse wrecker of an airplane's insides than ulcers were of Osborn's; "Dilbert," an incredibly smug cadet whose vapid grin spelled sure suicide. Somewhat later, "Grampaw Pettibone," a whiskery ancient mariner of the skies and caustic nemesis of flying idiots, was invented by Captain Seth H. Warner.

A veteran Navy flier, Warner was doing a tour as Aircraft Safety Counselor for the Bureau of Aeronautics. He became Grampaw Pettibone's ghost, studying accident reports, selecting outrageous examples of pilot witlessness, then instructing Osborn in the technical nuances of the disaster. Osborn, in turn, would draw Dilbert or the Spoiler in the process of creating calamity, and then a portrait of Grampaw delivering his sulfurous opinion of pilot error. Seth Warner would write the dialogue. Over the years, a few other competent aviators served as Grampaw's voice while Osborn continued to draw the errors.

These word-and-picture morality plays went into training manuals. As posters, they were prominently displayed wherever aviators could not avoid looking at them—in hangars, in barracks, in briefing rooms, on the bulkheads of aircraft carriers and even on the bare walls above urinals. Osborn added the victim aircraft to his cast of characters. His planes winced as their bellies were filed off by wheels-up landings. They shuddered through dives above the airspeed redline, they bent and groaned under the wracking Gs of a too heavy-handed pullout from a bombing run, they wept when lost over the ocean by navigators who did not know how to navigate.

In time, Grampaw and his associates became folk heroes—and antiheroes—of Naval aviation. And they all, even Dilbert, survived the war and continued as relentless reminders that an airplane is no toy. Nobody knows precisely how many lives were saved, but the Navy thought the number considerable. In 1958, Secretary of the Navy Thomas Gates pinned the service's highest noncombat medal, the Distinguished Public Service Award, on Osborn.

The most persuasive reason Osborn has for disowning the notion that he taught anybody how to fly is that nobody could ever teach *him*. Not that the Navy didn't try. Early in his career as Dilbert's constant companion, it became evident that if he were to serve, even at second hand, as adviser to fledglings, he ought to learn firsthand a little about the art. The Navy agreed and sent him up with an instructor in an N2S "Yellow Peril." It didn't work; those skillful hands, so knowledgeable when it came to dealing with the

business end of a pencil, simply could not get the hang of a control stick.

The Navy, which does not like to confess defeat, hated to give up on him. With different airplanes and different instructors, they tried him at Atlanta, Pensacola and Corpus Christi. They even tried him flying blind under the hood. No go.

Now and then, on his aerial excursions, he has picked up a firsthand example of what Dilbert and Grampaw Pettibone were all about. At Miami he was taken for a ride in an SNJ. At 10,000 feet, the pilot pushed over in a near vertical dive and held it while Osborn watched the air speed needle—the dial was redlined at 200 knots for that plane—creep up to 218.

"I was absolutely petrified, expecting the wings to come off." Since the pilot outranked him, Osborn's only possible revenge was to draw Dilbert diving an airplane past the redline. Another time he was up with an instructor in an N2S when another trainee made a playful pass at them. Osborn's pilot pushed over smartly to evade, and Osborn found himself hanging upside down in an inverted plane. He had neglected to buckle his seat belt. He stayed in the plane by grabbing handholds and spread-eagling his legs against the sides of the cockpit. "Of course I was wearing a parachute, but I hate to think of falling free while I searched for the rip cord—inept as I am." His pilot on that occasion still bothers his sleep, for he cannot remember the name. And the man haunts him because he saw him once again after that memorable ride.

In June 1944, to broaden his experience, Osborn was sent to sea duty in the Pacific. He was aboard the *Essex* off Saipan when the Japanese carrier fleet struck. In an aerial combat that ensued, that former instructor who had almost lost Osborn was flying a Hellcat.

The man, whose name Osborn cannot remember, had been hit and was returning to the carrier. He radioed that he was bleeding badly and could not see very well. Two of his squadron mates closed in on either side to talk him down to the *Essex*. On the first pass they got him within 400 feet of the flight deck, but too high. They tried to lead him around again for a second approach, but it was clear that the pilot was blinded by blood and growing weaker. He knew, of course, that if he landed badly he would smash into the planes stacked on deck, probably killing men.

Osborn finds it painful to recall the scene today—a young man departing toward death. He says, simply, that the pilot "just flew away out to sea, while the task force ploughed steadily on into the dusk."

Over the six decades of his love affair with aircraft —a portfolio of his work will go to the Library of Congress—Osborn has had to adjust to radical changes, from the Blériot, that frail and lovely dragonfly, to the almost wingless dead weight of today's F-4 Phantom II. He can approve of the heavy jets—even of the "inexcusably noisy Concorde." But in his heart he prefers the dainty, graceful and "jaunty" planes of half a century ago.

He still visits the Smithsonian to gaze at the original Wright Flyer with "every strut, every metal fitting, even the varnish on the wings so exactly right and so honestly beautiful."

Osborn's landing Concorde is droop-beaked bird surrounded by tangle of shattering soundwaves.

To depict Vietnam warfare, Osborn painted this Army helicopter, baring painted teeth as it attacks.

How your car can lose 2000 pounds on the Thornel diet.

Your present car weighs a lot because there's a lot of metal in it.

Now, imagine replacing most of that metal with a material that can lead to the reduction of the weight of a car, by half.

That's the Thornel® diet.

Thornel is a remarkable graphite fiber, produced by Union Carbide, which when used to reinforce high performance plastics, creates a material that can have five times the strength and stiffness, for equal weight, of metals.

In addition, Thornel absorbs shock, dampens vibration and will not rust or corrode.

Right now, there is a study showing the feasibility of taking a 4000-pound car and reducing it to 2000 pounds by using graphite materials for such parts as hood and trunk lids, doors, body panels, chassis and suspension members, wheels and bumpers.

While this is being developed for the future, there are things happening now. Thornel fiber is being used in space vehicles, airplane components, bicycle frames, golf clubs, tennis rackets and fishing rods.

Thornel. One day it will make a big car with the weight of a small car.

And that's no small achievement.

UNION CARBIDE

Today, something we do will touch your life.

UNCLE SAM
NEEDS
THAT
EXTRA
SHOVELFUL
Help Uncle Sam to Win the War
by following these Directions:
1. Fire small amounts of coal often.
2. Keep fuel bed even by putting coal on thin spots. Avoid raking and slicing.
3. Keep fuel bed about six inches thick.
4. Look out for air leaks in brickwork.
5. Increase or decrease steam pressure by opening or closing draft damper in uptake.
6. Clean fires when the demand for steam is small, and while cleaning have the draft damper partly closed.
UNITED STATES FUEL ADMINISTRATION

The government exhorted Americans to help win the war overseas by cutting heat and conserving coal.

New Yorkers struggled to get coal during the famine, above. Extreme cold intensified the crisis, and

By James P. Johnson

The fuel crisis, largely forgotten, of World War I

Normal business ceased in the industrial East and Americans lost millions in earnings, as a heatless, lightless public suffered

Long lines at gasoline pumps in the winter of 1973-74 and skyrocketing fuel costs have convinced many Americans they are trapped in a worldwide fuel crisis. Some blame the Arabs, some the U.S. government. Most believe that fuel shortages are a recent phenomenon. Few realize that in wartime 1918 the government closed down Eastern industries to solve another fuel crisis.

In January of that year Dr. Harry A. Garfield, son of President James R. Garfield and president of Williams College on leave as U.S. Fuel Administrator, forbade all manufacturing plants east of the Mississippi to burn coal from the 18th to the 22nd, and ordered wholesale and retail establishments in the same region to stay closed as well on the following nine Mondays. Protested strenuously by Congress, the press, civic leaders, businessmen and the general public, the order nevertheless stood. Normal business ceased in America's industrial East.

Some 1.5 million workers in New York City alone did not report on "Garfieldays." Office buildings and department stores stood vacant. Thousands milled about, gathered in unheated, unlighted saloons and

in one week alone the city reported 263 pneumonia deaths. Those who could bought kerosene heaters.

A cartoon assails the Wilson Administration for summarily ordering the five-day shutdown.

pondered ways to recoup lost wages. In the midst of the Great War, the nation took a holiday.

David Belasco, George M. Cohan, Lee S. Shubert and some other spokesmen for New York's theaters won the right to stay open during the holiday Mondays if they closed down on another day. Governor Charles S. Whitman of New York refused to close state banks. Some war plants won exemptions. The New York Stock Exchange voted to remain open and operate without heat or light. Traders on the floor wore overcoats and heavy sweaters, while upstairs clerks and office staff worked by candlelight.

Rich and poor suffered alike, if not equally. Thomas Fortune Ryan, master financier, found that the special elevator that normally transported him to the exclusive Midday Club on the 20th floor of the Broad Exchange Building had been shut down. Rather than wait in line for a crowded regular elevator, he ate elsewhere. Kodak's George Eastman turned off the heat in his Rochester greenhouses, sacrificing plants worth thousands of dollars. Developers of Lakeland, Florida, advertised: "COME TO FLORIDA, The Permanent solution to the Coal Problem. . . ." Macy's ran a promotion campaign to encourage buyers to make up the lost shopping days.

On the first Monday a holiday spirit spread through midtown New York. The press reported that the city had taken the crisis with stoic calm: fewer than 50 complaints. To help keep people occupied, the government allowed theaters and saloons to remain open. Restaurants also were operating but, ironically, could not sell liquor. Bars, on the other hand, were permitted to do business from sunrise to sunset, although they were not allowed to use heat or light. *The World* reported that "most of the groggeries were crowded. The patrons did not care about the lack of outer, artificial warmth." Fleischman's Baths on 42nd Street defied the order and used both heat and light. U.S. Marshal Thomas McCarthy instructed his agents to put the bathers out. Impossible, the agents said. It was ladies' day.

By nightfall, Eastern cities descended into eerie darkness. *The Herald* reported that a candle at street

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level on Broadway cast a six-block shadow and that lights from an automobile seemed like meteors. The large advertising signs, shop windows and outside signs were dark.

Office boys cheered the unexpected vacation time, but millions lost wages and anger swept the nation. *The World* declared: "Dr. Garfield has performed the miracle of making the public revolt because of a holiday." And added that "Dr. Garfield receives a salary of $1 a year from the government, and there are lots of people who think he is worth it."

Like the more recent fuel crisis, the shortage of 1918 had been long in the making. The roots extended far back into the 19th century when America's coal industry mushroomed chaotically. Between 1870 and 1914, bituminous coal production zoomed from 17 million tons to 423 million. Constant expansion produced a buyers' market. Consumers became accustomed to low prices—usually around $1 a ton.

This was an era when titans such as James J. Hill, Andrew Carnegie, J. P. Morgan and John D. Rockefeller were creating monopolies in their fields. Yet all attempts by the coal operators to organize failed. There were too many of them to merge; they were geographically too widely separated; no single operator had large enough holdings to control the competitive markets. Coal men tried price-fixing schemes, trade associations and state legislation to no avail. They used the Interstate Commerce Commission and even sought the assistance of a fledgling union. No use. Low wages, low prices, waste, inefficiency and disorganization still plagued the industry on the eve of the Great War.

The shots at Sarajevo in 1914 revolutionized the coal industry's prospects. Demand for coal skyrocketed as European orders for iron, steel and munitions flooded into America, outracing even the huge supplies available here. Although nearly 80 percent of American coal production was under contract at fixed rates, prices for the rest leaped skyward. Pittsburgh's open-market coal had gone for less than $1 a ton in 1915; by the spring of 1917 it commanded more than $5. Shortages generated panic. Middlemen made killings overnight.

The formerly "sick" industry suddenly looked to the public like an extortionist. As late as 1916 Congress had been investigating the disastrous financial condition of the industry. By April 6, 1917, when the United States entered the war, liberal Congressmen were pressing for government price-fixing and discussing possible government management of the bituminous industry.

In an attempt to stave off possible government regulation, the coal people cooperated with Wilson and attempted to open up transportation bottlenecks and free the fuel. They also moved to cut ascending coal prices. In the meantime, government brought an antitrust case against the industry, which it lost.

Defeated in the courts, the administration scored a victory in the legislative branch. On August 21, 1917, Congress gave the President power to fix coal prices directly. He lowered the boom on the coal operators, arbitrarily reducing coal prices to $2 a ton. Operators were outraged. *The New York Times* counseled the President not to feel "reproach" if he had to raise coal prices to maintain production.

Two days later the President appointed his old friend and academic colleague, Dr. Garfield, to head the Fuel Administration. Garfield had had some

An elderly woman searches through rubble for wood remains at the location of a fire at 440 Broadway.

minor experience with coal mining as a lawyer in Ohio, but he was not the "practical coal man" the operators might have wished to see get the job. He got off to a bad start with some remarks comparing the coal operators to the "robber Barons of the Rhine" and by refusing to allow men with connections to the industry to head the state fuel administrations. Up to this point, the Wilson administration had done little toward insuring a full supply of coal for the winter.

Transportation shortages aggravated the coal problem. Garfield tried to get preferential movement for coal on the railroads. But Food Administrator Herbert Hoover protested that coal should not have priority over food. He won. As winter came on, the miners were unable to ship nearly as much coal as they could dig from the earth.

In October, coalless Ohio residents fumed as coal heading toward Great Lakes ports moved through their state under priority shipment. They began to hoard what coal they could get, creating further shortages, and tore up railroad tracks to prevent coal from leaving the state. In November the mayor of one town hijacked a train laden with coal and arrested the engineers and conductors. He contended that the "law of humanity" took precedence over the right of property.

Railroad tie-ups and breakdowns contributed to the coal shortage. At major Eastern cities, goods destined for Europe lay on sidings while newly arriving trains further clogged the terminals. Mines that needed empty cars for loading could not get them.

The Almighty, on whom Wilson tended to lean heavily, added the final crushing blow: one of the worst winters in memory. Beginning in mid-December, bitter winds brought a massive cold wave that covered the nation except for the Pacific coast. Temperatures reached all-time lows: 4 below zero at Philadelphia, 14 below in Boston. Gale-force winds capsized ships. Iced-up harbors kept coal barges from moving along the coast and across the Hudson into New York. Coal froze in dealers' lots. A man walked across Raritan Bay—frozen solid for the first time in anyone's memory. The closing of the harbor in Stamford, Connecticut, ended coal movement and forced the school system on a three-week extension of the Christmas holiday.

Lacking fuel to heat homes, residents of New Jersey opened their taps to prevent water from freezing in the pipes. This so lowered water supplies in Jersey City that locomotives were denied water. Those who did not keep their taps running saw floors cake with ice as pipes burst.

Cold brought death to hundreds. In one week New York City reported 263 pneumonia deaths. A baby in the Bronx froze to death in her crib. The Brooklyn father of two-month-old Mabel Daldamus spent the day in search of 50 pounds of coal. He came home with his coal to find his daughter dead. A man in Detroit who remained in an unheated house froze to death.

Wealthy and middle-class people purchased kerosene heaters. The poor suffered. A New York family burned their furniture, old shoes and children's wooden toys for heat.

Panic swept through New York City. In Brooklyn, would-be purchasers hurled bricks, stones and coal

Under police protection, coal is loaded onto wagons. Some drivers were attacked and the coal seized.

Residents of a New York slum purchase coal by the pound. The poor were hit hardest by the crisis.

Frank Clements glided over the snowy streets of Chicago in a sleigh pulled by two reindeer.

scuttles at merchants who couldn't give them coal. On the then less fashionable East Side, coal wagons were stormed. Men jumped atop coal trucks and threw the coal en route to Bellevue Hospital into the street. Harlem youths stoned coal truck drivers, then unhooked the chutes to release the coal.

In late December the government took over the railroads. William McAdoo, as Director General of Railroads, immediately abolished all priorities except coal. But government operation of trains, although helpful as the war wore on, could not open frozen harbors or unload frozen coal.

Garfield and his state fuel administrators began conservation measures. A card-rationing system was instituted in New York City. In New York state all outdoor electric lights—save those required for public safety—were blacked out every night except Saturday. The Thomas A. Edison Company's inspector threatened personally to cut the wires of those violating the order. Following a warning, an official did so at a store on 125th Street.

In Brooklyn, Sylvia Loines volunteered her car and services to deliver coal to the city's poor.

Some brave New Yorkers attempted to ring out 1917, but most stayed home. Florenz Ziegfeld's new *Midnight Frolic* opened on New Year's Eve. The curtains parted to show a brightly lighted New York skyline. Abruptly, "Garfieldian darkness" descended, as the Ziegfeld Girls proclaimed that *they* would be the wartime bright lights of the Great White Way.

A cabbie reported that New Year's Eve was "a drunkless, lightless, and almost a tipless night. I didn't carry anyone who celebrated in the good old way."

January 1918 brought no relief. The cold wave continued and the coal crisis worsened. Ice three feet thick choked Baltimore harbor. Frantic masses of the poor raided coal cars and sheds despite police and railroad guards. In Cleveland, two-thirds of the factories closed for several days to save power for streetcars and homes. Finding that he could not legally confiscate coal, New York's Mayor John F. Hylan ordered his police to canvass the neighborhoods, door-to-door, to beg for the poor.

Jersey City turned off electric power and McKeesport Tinplate in Pittsburgh shut down on the 11th. A major munitions plant notified Garfield that it might have to close. On January 15th the New York *Evening Post* ran this headline: "RAILROAD CONGESTION AT ITS WORST TO-DAY." The article told of how more than a hundred vessels—many carrying the sinews of war—were unable to sail for Allied ports and elsewhere for lack of coal. Railroad yards were so clogged that coal-laden trains stood on sidings, unable to unload their precious cargoes.

The situation at the ports brought the crisis to a head. A wall of ice encircled Staten Island and stretched clear to the Jersey Shore. A person could walk from Staten Island to Sandy Hook. During the

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Washington's farewell at Fraunces Tavern may well have included Martell.

1783. General Washington resigns his commission and asks Generals Lafayette and Rochambeau plus his closest officers and friends to Fraunces Tavern in New York. Here he will personally say farewell and thank them for their loyalty.

And what more appropriate way for devoted officers and friends to wish this great patriot well than with a glass of Martell Cognac. For by 1783, Frenchman and American had long agreed, Martell was cognac unequalled.

It still is.

Martell. Taste history.

V.S.P.-V.S.O.P.-CORDON BLEU.
WORLD'S LARGEST-SELLING COGNACS.

first half of January many coal barges sank in ice-clogged New York harbor. Steamship owners feared that fire might sweep through the moored vessels.

Railroad chief McAdoo declared that the week of January 14 would be "Freight Movement Week" and urged every effort to unload freight and unclog the harbors, particularly New York. Fuel Administration officials debated alternative plans. Shutting down non-essential industries to save coal seemed a logical step and was expected by the public. Declaring Monday holidays was also discussed, but objected to by some officials as being inadequate. Garfield sent his conservation chief to Boston and New York to inspect conditions and was told that extreme measures were now required.

The banner headline in the January 17 *New York Herald* told the essential story crisply: GARFIELD SHUTS DOWN INDUSTRIES. ENTIRE BUSINESS WORLD STUNNED.

At a secret meeting on the 16th, President Wilson, Secretary of War Newton D. Baker and Secretary of the Navy Josephus Daniels had heard Garfield explain his proposal: shut down industry for five days to stop the flow of manufactured goods, so that the railroads could unload cargoes and free the rails for the movement of coal into the ports to fuel the waiting ships. Also, further to save fuel, impose Monday holidays. Wilson made several minor alterations in the plan and then gave Garfield his support.

Garfield quickly obtained McAdoo's blessing and issued an abstract of the order, effective at midnight of the 17th. Late for dinner at the Hoovers', Garfield rushed from the Fuel Administration offices. An aide grasped his elbow: "My God, how do you dare do it?"

Many Congressmen asked the same question. The Senate passed a resolution to delay implementation of the order for five days; the House resolution expressed its "regret" over the "summary action." Garfield awaited the avalanche of protests.

The Evening Post reported that "seldom in the history of the national capital has there been such a day as this. Seldom has an act of government met with such universal condemnation as the Fuel Administration's order. . . ." *The New York Times* blasted Wilson's "reliance upon mediocrity" and asserted that "chloroforming a nation to spare it the pangs of hunger is not good therapy, it is malpractice." A Brooklyn citizen wrote the President: "For Heaven's sake, revoke that coal order and be lively. . . . After you have revoked the order, please can that Coal Czar. If his brain is a sample of those that are going to win the war, we are done!"

President Wilson stood by Garfield, conceding privately that "There was nothing to do but retire to the cyclone cellar."

Few found much to admire in the decision. Wilsonian confidant Herbert Bayard Swope reported that there was "great satisfaction" in administration circles over the outcome of the order. He quoted cabinet members as being united in support and believing that "the order brings the war home to us. It makes us feel war instead of talk war." The cabinet members, wrote Swope, "see it as a test of American sincerity and devotion to the purposes of the war and the costs these purposes entail."

George Creel, who ran the Committee on Public Information, wrote that within 12 days of the order, 480 ships (a rather high figure) "carrying two million tons of food, fuel, munitions and other war supplies were bunkered and sent from our ports." To compare the losses in wages and production (estimated at more than $1 billion) with the small amount of coal saved (3.5 million tons) wrote Creel, was "beside the issue," since the coal shortage itself would have closed hundreds of factories eventually.

Why Garfield did not rely on a railroad embargo of other commodities to allow coal alone to move to the ports remains an enigma. McAdoo may have been unwilling to shoulder the blame for such an action, even though much of the problem at the ports was one of transportation. Garfield claimed afterward that using the embargo would not have been effective.

Garfield lifted the Monday holiday requirement on February 13, and the crisis passed into history. The story does not appear in most textbooks, beyond a mention that along with other war edicts, the government once proclaimed "heatless" days.

A young New Yorker totes home a bag of coal that wouldn't last long in subzero weather.

Enter: Polaroid's SX-70 Alpha 1

We've made our finest camera even better.

How could we top the original SX-70 Land camera? It does things no other camera can do:

You focus from infinity to 10.4", closer than almost any other camera without a special lens.

You look through the viewfinder and see right through the lens, so you know precisely what you'll get. (It's an SLR system.)

You press a button and a 12,000 rpm motor delivers into your hand an already developing picture, hard, flat and dry. In minutes, you have a big, beautiful finished 3⅛" x 3⅛" print.

In daylight, an electric eye automatically reads the light and sets the aperture and electronic shutter speed for you.

But we didn't stop there.

We've added a monitored flash that makes final corrections in exposure, to give you better indoor flash pictures. You can even use flash in daylight to fill in shadows and eliminate harsh light.

And our new Superclear SX-70 film with Colorlock dyes gives you better color, crisper detail and a wider temperature range. It is one of the most fade-resistant films in all photography.

The new Alpha 1, in genuine leather and a velvety chrome finish, folds into a flat, elegant shape to fit into pocket or purse. A leather neck strap makes it even more portable.

Polaroid's SX-70 Alpha 1. It's our finest camera, now even better.

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You can get this close with the Alpha 1 without a special lens...

while this is the closest most other cameras will let you get.

By Piri Halasz

America's own version of Matisse and/or Picasso—'Sandy' Calder

Photographs by Farrell Grehan

A master's retrospective show covers the delicate balance of the mobile, stabile—and all the stops in between

Is there an American, in 1976—himself moderately mobile—who has not, at one time or another, seen a Calder mobile? Almost impossible, if he is a museum-goer; but even if he is not. If he has passed through John F. Kennedy airport in New York, or the Dallas-Fort Worth airport, he may have walked beneath a Calder. Mobiles have been hung in U.S. department stores, offices and banks; a 55-foot-wide motorized wall mobile named *Universe* dominates the lobby of the new Sears Tower in Chicago (p. 77).

And, in other terms of social impact and effect, there is the fact, recorded in dictionaries, that the word "mobile" has another meaning entirely from its adjectival one; it is now a very familiar noun—you might even say that its synonym is "Calder." But Calder also stands for a good deal more than mobiles.

Sprouting in public places across the globe have been his mammoth "stabiles"—brilliantly painted sheet-steel behemoths that perch crablike on the pavement, or toss their heads jauntily in the air, conveying motion and grace although they may rise 60 or 70 feet high and weigh more than 50 tons.

Nevertheless, there are many aspects of Alexander (Sandy) Calder that are largely unknown to the general public. At 78, this bluff, easygoing, droll man lives for most of the year amid the rolling farm country of the Loire Valley in France. Clad in a red L. L. Bean work shirt and faded khakis, he daily disappears into his studio with the zest that has marked him always.

The extraordinary range of his output—encompassing much besides stabiles and mobiles—is also not widely known. Yet Calder is the "complete" artist. Like Picasso, Matisse, Max Ernst or Salvador Dali, Calder has displayed his wit and inventiveness in a staggering variety of media, forms and materials. Not only sculptor, draftsman and painter, he has turned his hand to woodcuts, etching and lithography; to rug and tapestry and even wallpaper design; to the crafting of toys, household objects, and a range of extraordinary jewelry which is highly prized by its fortunate possessors. He is responsible for the flamboyant exterior decorations of not one, but two Braniff International jets.

Piri Halasz, formerly art critic for Time *and a student and writer of modern art history, wrote about Max Ernst in* SMITHSONIAN, *March 1975.*

In heady postwar Paris, the circus was a commentary on fate and folly, a source of inspiration to many artists. Calder's manipulated and vocalized version was a hit among the avant-garde and the eminent.

Sears Tower, Chicago

Universe is motorized, weighs 16,174 pounds, is 55 feet wide and 33 feet high.

The Whitney Museum of American Art in New York has designated Calder its Bicentennial artist, and is currently staging *Calder's Universe*. On view are more than 200 works of art, divided into 17 categories. The objects run the gamut from six kinds of sculpture to stage props for a Broadway comedy, from a photograph of a Calder-designed acoustical installation in Caracas to a BMW car which, painted with Calder's design, raced at Le Mans last year.

After the exhibition closes in New York, on February 6, it will be seen at the High Museum in Atlanta (March 5-May 1); at the Walker Art Center in Minneapolis (June 5-August 14); and at the Dallas Museum of Fine Arts (September 14-October 30).

Concurrently, the Viking Press, with the Whitney, has published *Calder's Universe,* the most comprehensive survey yet of his accomplishments, and one which benefits from the artist's warm cooperation in helping with the book and the exhibition. The exhibition is supported by a grant from the Champion International Corporation.

In the many earlier books and articles written about Calder, the point has often been stressed that he is a very "European" artist, an expatriate American who developed ideas for the mobiles—and indeed his entire mature styles—while living in Paris in the 1920s and the 1930s.

In form quite unlike the work surrounding him,
Calder nevertheless is a considerable figure,
a monument of a man, a force to be reckoned with.

This emphasis, especially in recent years, has served to distinguish him from the late David Smith, who is described as the more truly "American," having achieved his mature style on native soil. Though Smith was born only eight years after Calder, he did not achieve prominence until the 1940s and the 1950s, when New York itself had taken over from Paris the title of "art capital of the world."

Certainly, some of the differences which characterize the work of the two sculptors can be described in terms of two environments. Calder's works have the wit, the gaiety and the streamlined elegance which can also be found in the sculpture of Jean Arp and Constantin Brancusi, two other masters involved in the earlier Paris art scene. Smith's work, on the other hand, possesses the uniquely rugged and uncompromising character which is also the hallmark of the painters of the "New York School"—Jackson Pollock, Willem de Kooning and Mark Rothko.

However, to say that Calder is nothing but Parisian is to do a disservice, not only to him but also to his birthplace. While no artist living in America, prior to 1930, had been able to establish an international reputation, the country nevertheless had a vital and challenging society, with distinctive mental attitudes and ways of looking at things. It also had artists who, while not in themselves perhaps great, understood the nature of greatness.

Rooted in Yankee tradition

Calder, no less than Smith, benefited from this. He did, in fact, precede Smith in synthesizing an American outlook and experience with European modern styles. *Calder's Universe* is, among other things, a way of repatriating the expatriate—in that it deals with Calder's roots in American artistic traditions, and abundantly documents the Yankee fascination with ingenious inventions which relates the artist in spirit (if not end product) to such diverse geniuses as Thomas Alva Edison and Henry Ford.

At the entrance to the exhibition, visitors are greeted by an 11-by-18-foot working model of the Sears' *Universe*, with its big pendulum oscillating, its huge horizontal helix coiling within itself, and its stately pennants rotating. *Universe*, just two years old, is a fitting introduction not only because it is mechanically one of Calder's more advanced creations, but also because of its title.

Both Calder's father and his grandfather were sculptors. The founder of the dynasty, Alexander Milne Calder, was a Scottish emigrant to Philadelphia; his masterpiece was the 37-foot statue of William Penn that still crowns Philadelphia's City Hall. Alexander Stirling Calder, his son, carried on the family calling

Museum technicians work on elaborate scaffolding to install Calder mobile to its best advantage.

Private collection, Neuchatel, Switzerland

In early 1940s, Calder created a galaxy of tensile *Constellations* of wood and wire—this one in 1943.

of robust and noble public icons. However, he was also friendly with an earthier circle of Philadelphia painters. In the early years of the new century, this group—known as the "Ashcan School"—was to decamp to New York and startle that town's genteel salons with trenchant portrayals of slum life and of the rowdy entertainment world.

Sandy's mother was a painter, too. Although the family moved around, from Philadelphia to the West Coast and back to New York, Sandy was usually given a cellar workshop to indulge his hobby of making things. He made jewelry for his sister's dolls, Christmas tree decorations, and armor out of scrap metal to play at Sir Tristram and Sir Lancelot.

The boy was not interested in a career in art. Upon graduation from high school, he entered the Stevens Institute of Technology in Newark. Receiving a degree in mechanical engineering, Calder knocked around in jobs connected with that field. They bored him. He took a night-school drawing class, but chucked that in 1922 to hire on as a fireman on a ship headed for California.

Learning from the loggers

In Independence, Washington, he got a job making out paychecks at a logging camp. Here he found himself greatly interested in the techniques being used to tame the mountain fastness.

The loggers would scale enormous trees, "top them off," and fasten 200-pound pulleys to their summits. Each tree was guyed with eight steel cables. Another cable, passed through the pulley, was used to wrestle felled logs down the slopes, with the aid of a donkey engine on the ground.

To get the logs across ravines, the loggers strung up a cable between two standing trees, one on either side of a ravine. In retrospect, it is not hard to see these logs, dangling on high, as the prototypes of Calder mobiles, but of course young Sandy was years from being able to distill the visual thrill into sculpture.

He sent home for his paints and brushes, to depict the situation. With money saved from his sawmill job, he returned to New York, and a full-time program at the Art Students' League.

His teachers were the old Ashcan rebels, John Sloan and George Luks and others. The student's first paintings, of construction sites and night cafés, were in the same idiom. Still fond of tinkering, he rigged up a wire rooster sundial for his one-room apartment. He got a job sketching prizefighters and Paavo Nurmi for the *National Police Gazette* ($20 was the pay for a half-page layout).

In 1926, Calder went to Paris. He took drawing classes, but Paris also liberated his passion for tinker-

ing. In his tiny studio in Montparnasse he set up a workbench. With tools from a local hardware store, he made small, articulated animals and people out of wood, wire and scraps of fabric.

They were circus performers: trapeze artists, a sword-swallower, a ringmaster, elephants, lions, a four-horse chariot and others. He started giving performances in his room, for his young friends, with a phonograph playing cakewalks and *Ramona*—racing the chariots around the ring, making the acrobats perform stunts, giving the barker's spiel himself.

Paris had a special place in its heart for the circus. Le Cirque Medrano, in Montmartre, had interested Degas, Seurat, Toulouse-Lautrec and Picasso.

To avant-garde Parisians, in the 1920s, the circus was still a microcosm of *la comédie humaine*. The laughter, the suspense, the competition and the occasional horror seemed more appropriate than ever to the painters and poets of that moment; they were caught up in the afterglow of Dada and the flowering of Surrealism, those twin movements which had made lunatic gestures, nightmares, Freudian double-entendres and humor respectable in highbrow circles.

The circus proved a springboard to Calder. He was emboldened to make deft, wonderfully fluid little figures entirely out of wire: Josephine Baker, Helen Wills, Jimmy Durante, John D. Rockefeller.

Toys for grandchildren

Returning to drawing, he found that the fluid line of wire could be carried over into splendidly vigorous pen-and-ink pictures of circus performers. He also landed a job designing toddler pull-toys for an Oshkosh, Wisconsin, manufacturer. These toys were like some he had made for his sister's children, and they were to have descendants in the 1930s and the 1960s, because Calder was having descendants of his own.

On the liner back to New York, in 1929, he had met a young bluestocking from Massachusetts named Louisa Cushing James, the grandniece of psychologist William and novelist Henry. Sandy and Louisa were married in 1931, and in the course of time produced two daughters, Sandra and Mary, who have had four children in their turn. Some of Calder's gifts to his grandchildren are included in *Calder's Universe:* sprightly little tin birds scissored from ale and coffee cans and Scotch tape containers.

Returning to Paris in 1930, Calder experimented with painting, then returned to sculpture. When his first abstract wire sculptures were exhibited there in 1931, his reputation was made as a major artist.

Calder had had a strange feeling in Mondrian's studio on his return: he had felt as though the colored cardboard rectangles should "oscillate." The next year

Federal Center Plaza, Chicago

Scale model of *Flamingo* stands before photo mural of original, 53 feet high, which is in Chicago.

Honored by birthplace, Philadelphia, the artist arrives, appropriately, in "Calderized" jet.

Sense of play is predominant in Calder's character; toys are a part of his work. Here: *Chock,* 1972.

he did a series of wire sculptures that were mechanized and did move (Marcel Duchamp, the father of the Dadas, promptly christened them "mobiles").

Unfazed by frequent mechanical breakdowns, Calder switched to mobiles that were ingeniously cantilevered and balanced so that they derived their motion entirely from the breeze, and had the free, spontaneous movements of life itself.

"Just as one can compose colors, or forms, so one can compose motions," the artist has explained. And what is distinctive about this work, and characteristically American, is the flair with which Calder links technology to esthetics, bridging the gap between art and science in a way foreign to European thinking.

Calder is not the first American artist to strive to unite scientific investigations with art. In the 18th century, Charles Willson Peale was equally famed as a portraitist of Washington and Franklin, and as the founder of the world's first natural history museum. Samuel F. B. Morse is best known as the inventor of the telegraph, but earlier was one of Manhattan's more influential painters. When Philadelphia's Thomas Eakins, painter of *The Gross Clinic* and *The Agnew Clinic,* visited the Universal Exposition in Paris in 1867, he made a beeline—not for the picture galleries, but for the locomotive and machinery exhibits.

Calder himself is probably not fully aware of the heritage which assisted him in utilizing experiences as diverse as fashioning dolls' jewelry or watching small men handling tall trees. But each experience has had its outgrowths. From 1933 to 1953 the Calders settled in Roxbury, Connecticut. Once out of a cramped Paris studio, Calder found his mobiles moving toward the scale of those trees. In 1934, he made his first outdoor mobile, *Steel Fish.*

As a former circus master, it is only natural that Calder should have designed sets and costumes for theatrical undertakings: modern dance productions for Martha Graham in 1935 and 1936, a play starring Gérard Philippe and Jeanne Moreau in 1953, and an ambitious "ballet" of mobiles with electronic music, staged at the Rome Opera House in 1968.

Calder's obsession with perfection in everyday objects has led him to make ladles, lighting fixtures and cupholders for his American home. Rugs? Well, Sandy designs them for Louisa and her friends and Louisa hooks them. Tapestry designs? Of course.

With his appetite for work continuing unabated, Calder's recent output includes a stream of gouache paintings, mobiles and stabiles. Though his monumental stabiles have been commissioned for $300,000 and more, the fact is that Calder works on a monumental scale even when he doesn't have a customer. At Segre's Iron Works in Connecticut, one of two foundries where large stabiles are regularly fabricated, lightly rests the artist's latest whimsy—conceived purely for his own satisfaction: *Flying Dragon*—that is its name—is 56 feet wide and flame-red, an intoxicating sheet metal cross between a dragonfly and a jet airplane. More eloquently than words, it testifies to the continuing ingenuity, humanity and sheer bigness of Sandy Calder's vision.*

One can't compress Sandy into a few words./ Too much of him ....too large...

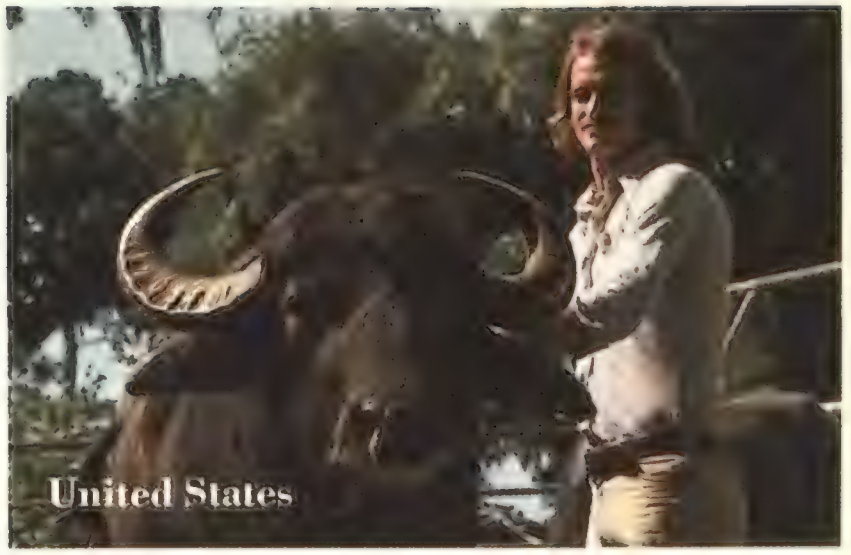
In his calligraphic handwriting, Robert Osborn (p. 52) salutes Calder, shown (right) in Philadelphia, where his grandfather and his father were also sculptors. The former's William Penn tops City Hall.

* *Calder died on November 11, as we went to press.*

India

By Noel D. Vietmeyer

Why not a tractor that provides meat, cheese—and love?



A University of Florida graduate student tends one of a small but promising water buffalo herd.

The water buffalo plowing a rice paddy could offer more than our familiar cattle and forestall possible meat shortages

The water buffalo is an unlovable animal that lives in the steamy heat of Asia, spends most of its life in water, and is used to pull a plow in a backward, inefficient system of agriculture. Right?

Wrong! Wrong on all counts. Though some Western people consider that an accurate picture of the water buffalo, the truth is quite the opposite. Indeed, some thoughtful animal scientists now believe that the water buffalo, squelchily dragging a wooden plow through rice-paddy mud, may be the most misunderstood, most underestimated and most neglected farm animal in the world.

We have a cultural bias against the water buffalo. We surround it with myths and half-truths that have never been tested. Our encyclopedias highlight the wild buffalo's ferocity, but unless it is wounded or severely stressed the domestic buffalo is probably the gentlest farm animal in the world. It was reared and used in Germany, France and Hungary in the Middle Ages, and in Italy it has grazed the swamps near Naples almost since the days of the Roman Empire.

Though most North Americans today consider the water buffalo only as a zoo animal, it is a well-established domestic animal on other continents: South America, Europe, Australia, Asia, and in one country of Africa, Egypt. Many of the countries where it thrives seldom have steamy heat: Bulgaria, Romania, Afghanistan and the Soviet Union, for example. Though in the United States we have avid proponents of cattle breeds such as Charolais, Simmental, Brahman (even a cattle-bison cross, called the beefalo), the water buffalo has been rejected without trial. The myths that it is a fierce, Asian, tropical, semiaquatic animal have been too pervasive.

It is not that way everywhere. Last-century Chinese indentured laborers brought buffalo to Hawaii; they couldn't bear parting from their faithful friends. Extensive paddy rice and taro farming sprang up based on water buffalo traction. For decades buffalo were an important source of power in the Hawaiian Islands. In 1905 many of Hawaii's buffalo dragged plows through swampy rice fields that are now Waikiki.

"Buffalo are phenomenally strong," says Professor Donald Plucknett of the University of Hawaii College of Tropical Agriculture. "They can work in far deeper mud than a tractor can. Even with mud up to their bellies they will forge on, dragging plow and owner both."

But the handful of thoughtful animal scientists who are standing up for the water buffalo see it as more than a living tractor. During the last five years Donald Charles, professor of veterinary science at Australia's University of Queensland, has reared water buffalo and cattle together under farm conditions. "Buffalo steaks are better than beef," he reports. "They are lean, tender, and on sight almost no one can distinguish the two. Furthermore, there's less waste with

Water buffalo like these are crucial to India's food supply; they supply 60 percent of the nation's milk, most of the cooking fat, and religion does not proscribe the eating of the animals themselves.

The author has been staff officer for the National Academy studies of new tropical food resources.

A farmer and his buffalo present the classic scene that most of us associate with this animal.

This river scene is not the Mekong but the Amazon. Introduced

buffalo. Because even by trying you can't produce an untrimmed buffalo steak with as much as 25 percent fat. This is in contrast to untrimmed beef in the United States which usually has at least 35 percent fat." Recently he conducted taste preference tests in which buffalo steaks were compared with those from Angus and Hereford cattle, the major breeds of beef. From the 40 cuts tested by the panel, the buffalo meat came in first and second.

(In Manila, two-thirds of the "beef" eaten in homes and restaurants is actually water buffalo, a fact that even Filipinos don't realize.)

Massively horned, coarse-skinned, wide-muzzled, spindle-shanked, the water buffalo lives out its life in almost complete silence. Rarely, except when greatly disturbed, does it make any sound; what comes out is a thin, wavering, querulous bark. They look more like cattle than the North American "buffalo," the hump-backed bison, but actually water buffalo are less closely related to cattle than are the bison. In addition, water buffalo are not known to hybridize with cattle; bison will. While there are some purebred water buffalo, many (including some pictured on these pages), are rough, rude animals with little pedigree. Two general types are often distinguished, however: the swamp type and the river type.

The swamp buffalo is a gray-to-slate, stocky, oxlike animal often seen in postcards and wooden statuettes from the Far East. Found from the Philippines westward to India, it wallows in any slimy puddle it can find or make, and it is distinguishable by its massive sweptback horns. It is used for traction and for meat.

The river buffalo is found even farther westward: from India to Egypt and Eastern Europe. Usually black, a taller, more cattle-shaped animal, with coiled horns, it avoids mud and prefers clean water for wallowing. It produces much more milk than the swamp type and corresponds to a dairy breed in cattle. India's 598 million people depend on it: in the late 1960s river buffalo made up 40 percent of India's milk animals, but produced 60 percent of its milk. Buffalo milk is rich—with a butterfat content twice that of cow's milk—and buffalo butterfat is the major source of cooking fat (ghee) in India. Buffalo meat is used, too: it is not forbidden by religion, as is that of cattle.

Water buffalo were represented on seals about 5,000 years ago in the Indus Valley, suggesting that they had been domesticated by then. A thousand years later they were in use in China. The ancient Egyptians, Romans and Greeks apparently knew nothing of them, but between A.D. 600 and A.D. 900 Arabs appear to have brought the animal from Mesopotamia and spread it throughout the Middle East. By the beginning of the 13th century, large numbers of buffalo had been dropped off by returning Crusaders throughout the region that is now Greece, Yugoslavia and Bulgaria.

The misinformation in the minds of Westerners results, at least in part, from the general disinterest of animal scientists in studying the water buffalo. A recent survey by the United Nations suggests that more buf-

40 years ago, water buffalo now number 200,000 in Brazil.

As this team demonstrates, water buffalo can pull a plow where most tractors can't go.

falo are alive today than at any time in history—perhaps more than 150 million.

That figure is about one-seventh of the world's cattle population—but water buffalo numbers are rising. The increase is fastest in parts of the world that few people connect with the animal; in Bulgaria, where during the winter blanket-draped buffalo are used to pull snowplows; in Italy, where large herds are still kept for the rich milk they give (it is made into the mozzarella cheese that Americans expect on the best-quality pizzas); in Brazil's steamy Amazon region, where a few introduced 40 years ago have multiplied to about 200,000 head and are expanding.

The Amazon provides a good example of the animal's adaptability. Both sexes have massive horns and they vigorously defend themselves and their calves against jaguars. During floods they swim to find forage, and range widely by swimming. Cattle, by comparison, retreat to patches of high ground, denude them of forage, and starve.

Buffalo meat and milk are now sold widely in Amazon towns and villages. The meat sells at the same price as beef. One author claims that a two-year-old buffalo gives more meat than two three-year-old cattle steers. Venezuelan animal scientist Abelardo Ferrer, who has been introducing buffalo into his country for two decades, believes that "if the original colonizers of tropical America had brought buffalo instead of cattle, the countries of my region would today be the greatest source of meat in the world."

During World War II Japanese forces occupying Southeast Asia ate so much buffalo meat that, to rebuild the populations, later governments banned the slaughter of any buffalo under ten years old. Most of the bans still exist, so that the many American visitors who have eaten buffalo have had only the tough meat from old, work-hardened animals.

Though it is neglected like a poor relation, the expansion and performance of the unpretentious water buffalo has been so outstanding that it is demanding to be considered along with its pampered cousin, the domestic cow. It has shown that it doesn't have to compete for the same forage, because it can thrive in marginal environments where cattle can't survive. One example is the swampy, pest-ridden Amazon, but another is where the only forage available is straw or coarse, nutrient-deficient grasses. Water buffalo can produce meat from tasteless, dry grasses that are inadequate to support cattle. Indeed, the buffalo's value to Asia probably results from its ability to live mostly on rice straw while the people lived on the grain.

"For nine years we've run cattle on the vast, grassy plains of the Sepik and Ramu Districts on the North Coast of New Guinea," says Dr. Phil Young, head of Small Holder Livestock Development for the government of Papua, New Guinea. "The forage is poor quality and the cattle were skinny and never did well. But a few years ago we introduced 30 buffalo. Their performance was spectacular; they produced more calves and much more meat than the cattle they were with.

These calves near Brisbane are well cared for, but several hundred thousand feral buffalo also thrive.

Knee-deep in a pond, buffalo devours water hyacinth, an appetite that could make it valuable in Florida.

We've since introduced another 500 and they've continued to prove so productive that we will soon expand the herd even more."

In Asia, the Middle East and Eastern Europe the buffalo's ability to survive on low-quality feed is a basis for human survival. It is the only animal that can live and survive and even thrive on the coarse grasses of the marginal land left to the peasant classes. Once a Chinese peasant woman told a visiting U.N. official, "The buffalo is more important to my family than I am. When I die they'll weep for me, but if our buffalo dies they may starve."

Water buffalo never became a major meat source in their traditional homelands because farms there are much too small for herds of animals, and because a peasant family's single buffalo, besides being a part of the family, was too valuable as a work animal to slaughter for meat.

The myth that water buffalo are vicious perhaps arose from confusion with the African buffalo—a wild, savage creature that is so distantly related to the water buffalo that the two will not interbreed and each is classified in a different genus. Perhaps the myth of viciousness arose from the accounts of hunters. Their exaggerations perpetuate the fiction of water buffalo ferocity. In 1968, *Sports Illustrated* featured a water buffalo hunt in northern Australia, and today, for only $250, Brazilian guides will take "brave" hunters on a buffalo shoot. But despite an intimidating appearance, buffalo are more like household pets: sociable, genial and serene. Doglike, they seek human company. "They're different from cattle, they're quiet as kittens!" says Donald Charles with an affectionate smile. "They have a natural fondness for humans and will lick—not kick." Patiently, without even swishing a tail, they will stand to be milked; there is no need for the pens that most cattle require. Even at slaughter they remain trusting and tranquil until the axman's blow.

A buffalo becomes a member of its owner's family, and it contributes to the family's success. Tractable, dependable and inured to boredom, the buffalo pulls plows, harrows, carts laden up to four tons; and, in the Amazon, buffalo teams pull boats laden with cargo and people through the shallows and reed swamps. The use of animal power may not be as "backward" as we have thought for the past few decades. The oil crisis has caused many farmers, even in the so-called advanced countries, to reconsider it. When working with a buffalo one must have patience, however. Its average walking speed is two miles per hour. Working in

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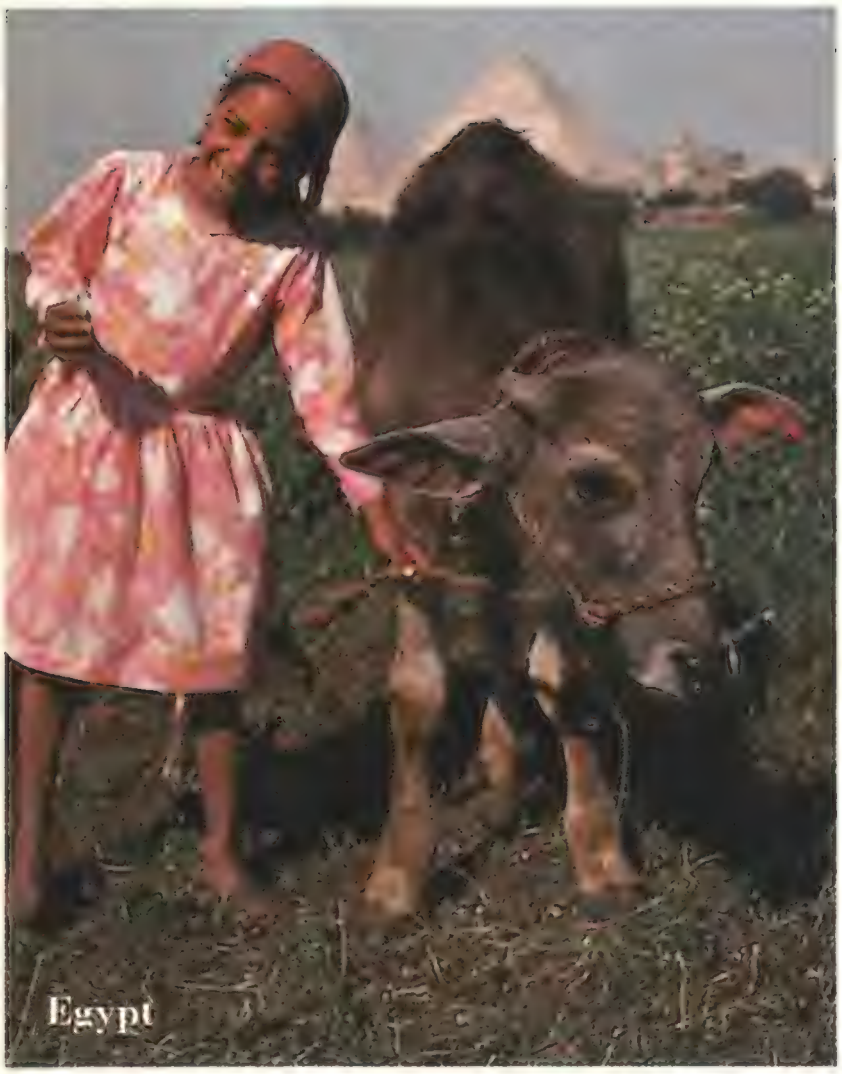
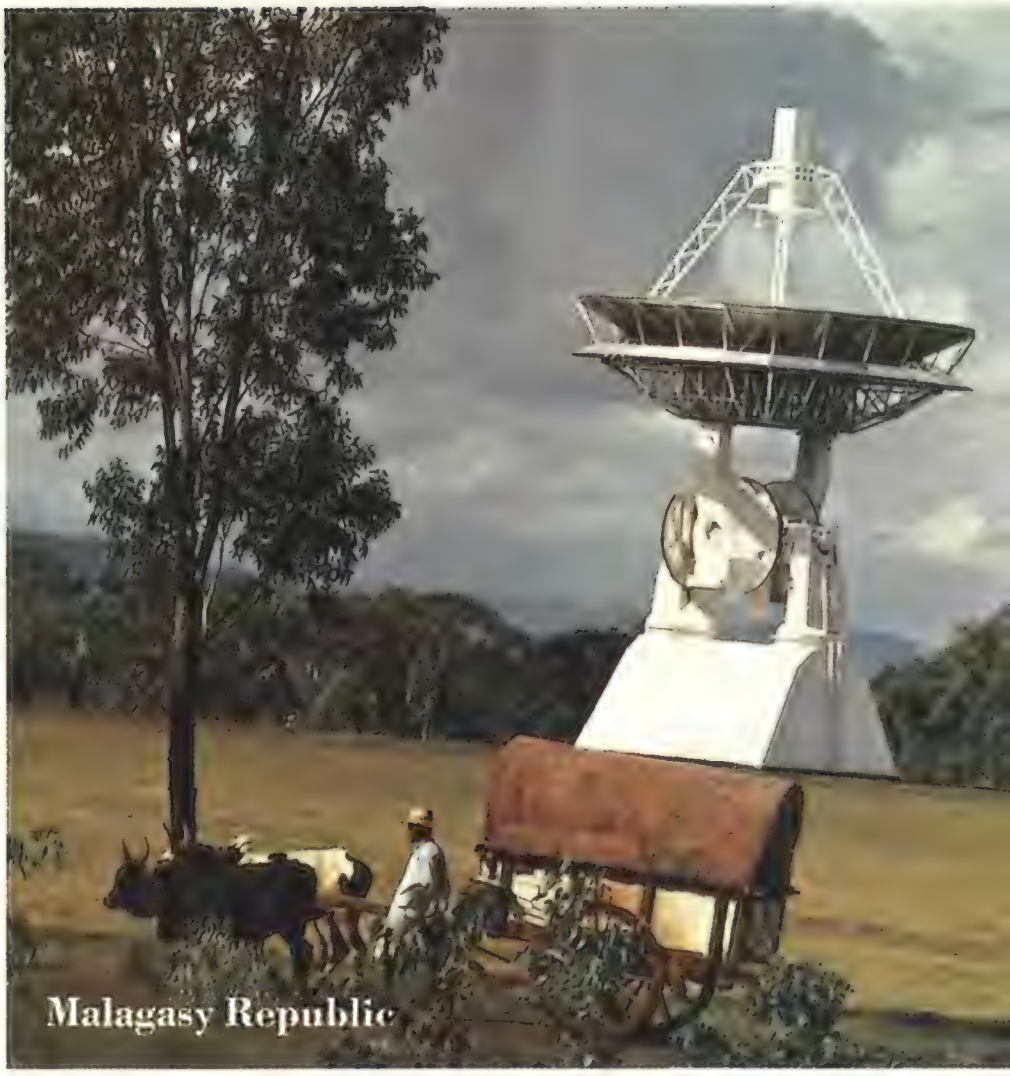


Buffalo have been used in Egypt for a thousand years, but are still scarce in the rest of Africa.

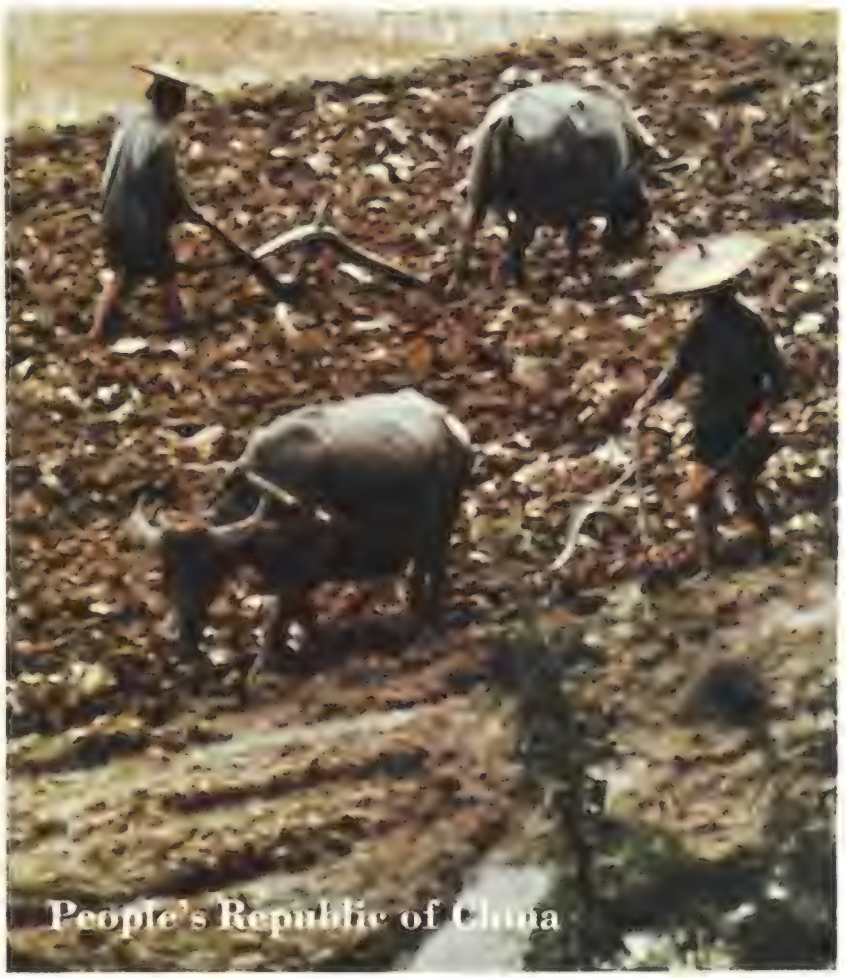


A team of buffalo trudging past a radio telescope may not be the anachronism they first appear to be.

deep mud, this pace will be even slower. " 'Once around the field . . . and home for lunch' used to be the half-facetious dictum of rice farmers on Kauai," says Professor Plucknett. But unlike the competition, the buffalo doesn't need gasoline and he will work for 20 years at least.

The family takes its responsibility, too. The buffalo is treasured, and family members quickly develop an empathy for it. Left unfettered close to the dwelling, the animal must feed itself, but the family shelters it in cold weather and nurses it in sickness. Though prone to some of the major cattle diseases, such as foot-and-mouth, water buffalo are healthy animals, as Professor Charles confirms. His buffalo were feral descents of Indonesian stock imported in 1824 to an ill-fated colony on the north coast of Australia. Within five years the colony collapsed. The buffalo were freed. In the wild they thrived, and several hundred thousand of their descendants still roam the region, exposed to harsh climate and disease. But, he added, "After only 14 days of [captivity] in a fenced paddock we transported them by truck and train for 1,500 miles from Darwin to Brisbane. There was no sickness, not even a sniffy nose," says Charles.

It is generally claimed that water buffalo must have



In China the family buffalo often is almost a pet; a peasant may take his animal with him on an errand.

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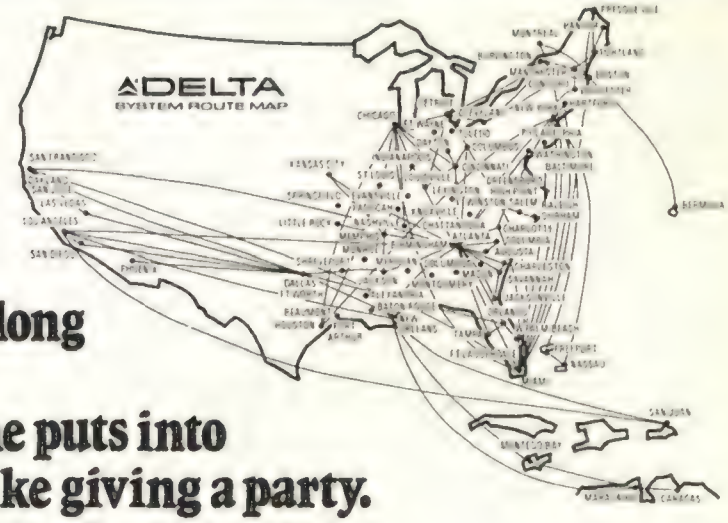


This is Delta's Wide-Ride™ L-1011 TriStar,® a $21 million superjet. Cabins are almost 19 feet wide. All 256 seats are two-on-the-aisle.

Water buffalo apparently were brought back to Europe by Crusaders; now they pull snowplows.

water for the wallowing that they love. Their sweat glands are few and their coat hair is sparse. When raising them it undoubtedly is best to provide water, but it is not absolutely necessary. In northern Australia hundreds of thousands of them survive an extended dry season each year.

Nevertheless, if buffalo get near water they eagerly wade in—right up to their ears. Wallowing cools and moistens their skins and a mud cake deters insects and ticks. Tropical rainstorms appear to give buffalo great pleasure, too.

The majority of animal scientists are unfamiliar with the animal, unfortunately; it's an alien species not treated in university courses. It is despised by the agricultural advisers that Western nations send to developing countries, and governments that wish to "modernize" are embarrassed by animals plowing their fields. Even in the countries that have buffalo, technically trained agriculturalists seldom study them. Professor Charan Chantalakhana, head of Animal Sciences at Thailand's leading agricultural university, told me recently: "We have the biggest and strongest varieties of swamp buffalo in the world. Yet Thai scientists have never investigated them thoroughly. We're only now realizing that we've overlooked one of our country's major resources."

With little research done on water buffalo, the sparse technical literature gives buffalo critics little detail upon which to judge the proponents' claims. Nevertheless, both sides agree that the time has come to investigate the husbandry of water buffalo, to transcend any cultural hang-ups and to judge the animal's strengths and weaknesses in an unbiased manner.

Research has begun in the United States, thanks to the efforts of Dr. Hugh Popenoe, director of the Institute for Food and Agricultural Sciences' Center for Tropical Agriculture, and Dean Charles Cornelius of the College of Veterinary Medicine at the University of Florida. After battling regulations for four years, they managed to import four buffalo in May 1975.

Professor Jim Hentges of the university's animal science department reports: "Already we can see that buffalo have potential for the United States, especially for Florida with its tropical and subtropical climatic conditions. They seem to segregate themselves from cattle and eat herbage that is unpalatable to cattle."

One plant they eat is water hyacinth, an aquatic weed that plagues huge tracts of the South. Perhaps more than a million acres of water are infested. If the buffalo can survive and grow in the marshy environment where such plants grow, they could become a boon to the region. As Hentges says, "They might clear the weeds and give us meat and milk to boot."

Apart from zoo specimens, the University of Florida's water buffalo are the first introduced to the continental United States. Now, for the first time, domestic animal scientists are working on the buffalo. The results they produce during the next few years may lead to growing appreciation for the animal. (The four buffalo, meanwhile, already have produced two offspring.) But whether it becomes a farm animal in the United States or not, it is clear that Western civilization will not scorn the water buffalo in the future as it has in the past.

Whatever our conception of water buffalo, it would be hard to resist the appeal of an Indian calf like this.

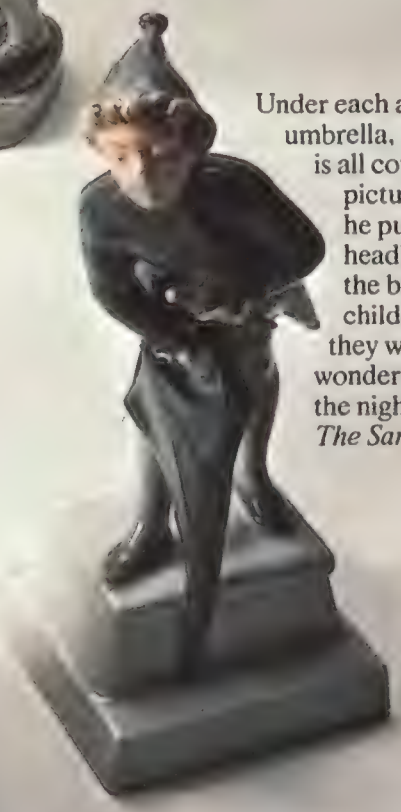
The Everlasting Magic of Hans Christian Andersen.

"Hello! Hello!" shouted Hans.
"Here am I! And look what
I found in the middle of the road!"
He held up a dead
crow for them
to look at.
Clod Hans

"These are the trousers. This
is the robe, and here is the
train. They are all as light
as if they were made of
spider webs! It will be as if
Your Majesty had almost
nothing on, but that is
their special virtue".
The Emperor's New Clothes

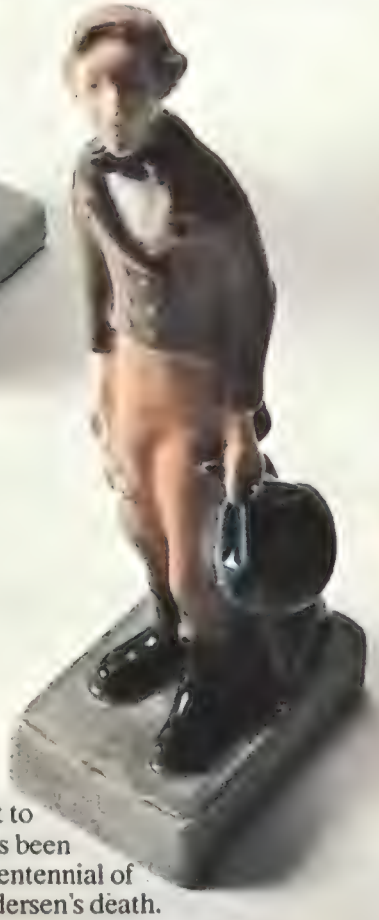
Everyone was dressed in their finest
clothes and they all were looking
at the little grey bird, towards
which the emperor nodded
very kindly. The nightingale's
song was so sweet that
tears came into
the emperor's eyes.
The Nightingale

"Ten
kisses from the
princess", said the
swineherd.
The Swineherd



Under each arm he has an
umbrella, one of them
is all covered with
pictures, and that
he puts on the
headboards of
the beds of good
children, so that
they will dream
wonderful stories all
the night through.
The Sandman

There sat
the dog with
eyes as big as teacups
glaring at him. "You are a
handsome fellow!" the soldier
exclaimed as he put the dog
down on the witch's apron.
The Tinderbox



The great story-teller
himself as he looked in
his youth on his first visit to
Copenhagen. This figurine has been
specially made for the Centennial of
Hans Christian Andersen's death.

The [illegible] of a
walnut became
Thumbelina's cradle, the
blue petals of violets her
mattress, and a rose petal
her cover.
Thumbelina

Buy your favorite fairy tale. Better still - collect them all. They belong together. Handpainted under the glaze, these porcelain figurines by Royal Copenhagen are a lasting tribute to the greatest fairy tale writer of all time. There are 15 of them and the prices range from $ 29.50 to $ 445.-.

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Looking like King Kong, a kudzu-covered oak advances on Atlanta as in a science-fiction thriller.

By Larry Stevens

King Kong Kudzu, menace to South

Once planted to nourish the soil, the vines now spread rapaciously into field and forest—growing as much as one foot a day

If you're ever in the Southern states and someone says, "Kudzu," don't respond with "Gesundheit!" Kudzu is nothing to sneeze at.

Kudzu has been the inspiration of poetry and song, it has starred in movies, it can grow a hundred tangled feet in one summer. Kudzu is a vine. It is lush. It is fast-growing. It is engulfing the South.

Almost everywhere you drive below the Mason-Dixon line, you can see great billowing waves of kudzu filling fields and washing over highway embankments. Tourists often comment on how beautiful and verdant it is. But if they look closer, they notice that where kudzu grows nothing else does. Kudzu's advancing tide swallows up all in its path, leaving only an occasional dead pine to stand like a piling from a long-vanished pier.

Kudzu's overwhelming will to live is the core of the ironic history of this plant—once declared the savior of the South, now considered at best a nuisance, at worst a scourge.

The hairy vine with its broad, three-pointed leaves came to our country innocently enough from the

Sign at right may augur ill for anyone who resists a vine that has plundered a million Southern acres.

A botanist from the University of Georgia studies this competitive and persistent weed.

Orient in 1876. The Japanese used it as an ornamental plant in their exhibition at the U.S. Centennial celebration in Philadelphia. Today, in the year of our Bicentennial, it is draped over a million Southern acres, plus innumerable old cars and houses.

By the 1890s kudzu had wound its way to the South. There it was encouraged to climb over porches. Its thick mat of vegetation provided welcome, cooling shade during the sweltering summer days. At the turn of the century, C. E. Pleas, a farmer in Chipley, Florida, was disappointed with the poor performance of his kudzu; so he yanked it up and threw it on a trash pile behind his house. Nothing can match the fury of a spurned kudzu plant, and within two years that pile and a vast area of the farmer's property were smothered by the vine.

Pleas was certain his trash heap had never looked so good, but thought no more of it. Not until he noticed that his chickens liked to eat kudzu leaves did the owner of the luxuriant garbage dump have an inkling of the potential the plant held. Pleas offered some of it to his cows. They ate it. He gave some to the pigs. Another clean and shiny trough. The goats loved it, too.

Eureka! Here was a forage crop that grew well without cultivation and could be fed to all his livestock. Pleas believed mistakenly he had stumbled on a discovery that would usher in a beneficial new era. He was filled with messianic zeal and set out determined to make the country kudzu-conscious.

The author is a free-lance writer in Atlanta, born and reared in the land of the kudzu vine.

But this Johnny Kudzuseed ran into difficulties. One was that American-grown kudzu does not produce seed in quantities. The other was skepticism on the part of his fellow farmers.

He did find a few converts, though. Some county agents began promoting kudzu as a supplemental crop after tests showed it had nutritive value at least as high as alfalfa. They learned also that kudzu roots can go seven feet into the ground. That meant it helped aerate the soil and, more important, could get water from deep in the earth, which kept it fresh during the late summer and fall droughts when other forages dried up. And being a member of the legume family, it restored nitrogen to the soil.

The land in the South had been depleted by years of planting cotton, corn and tobacco. Careless husbandry had allowed the topsoil to erode away, leaving the countryside covered with large running sores of red clay. The farmers were as poor and worn-out as their land. The Southern agrarian economy was suffering terminal malnutrition. Only a miracle could save dear old dying Dixie.

Well, said the kudzu crusaders, the age of miracles has not passed. For they had a plant that would grow on the hard, scarred land. Not only did it grow, it flourished. It revitalized the soil. It made good grazing. It stopped erosion. And as ground cover it was kind of pretty, especially whenever it bore its little purple, sweet-smelling flowers. Only one problem kept kudzu from being used as hay. The twisted mass of vines made harvesting almost impossible. But what the heck—it had all those other terrific qualities, and the engineering boys could solve the harvesting prob-

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It reportedly has pulled down telephone poles, forcing lines to be placed underground.

lem; so go ahead, plant kudzu. And a great many did.

Skeptics noticed, however, that the vine not only covered the spots where it was planted, but also invaded neighboring fields to choke out other crops.

The reign of kudzu really began with FDR's New Deal. The Agricultural Stabilization and Conservation Service, created to reclaim the nation's land, began a massive kudzu campaign in the South. Farmers who planted a kudzu crop would be rewarded with excellent pasture that controlled erosion and rejuvenated the soil.

The ASCS gave away millions of kudzu plants it received from the Soil Conservation Service nurseries. The SCS had its own kudzu program devoted solely to stopping soil erosion. From Maryland to Texas, thousands of men from the Civilian Conservation Corps were employed to plant kudzu along highways and byways, in every gully and gorge.

Kudzu's fame spread even faster than the vine itself. That was no mean accomplishment when you remember that kudzu may grow one foot a day, a hundred in a year. An Arkansas farmer quipped once, "When you plant kudzu, drop it and run!"

To meet the increasing demand for kudzu, SCS ordered seeds from Japan. But with the outbreak of World War II, the Japanese put an embargo on seeds.

Fortunately, that move did not cripple Uncle Sam's war effort. And although the kudzu grown in America is a poor seed producer, the cruel stoppage of seed did not mean cold turkey for kudzu consumers; for kudzu has the wonderful ability to produce a new plant from each joint, or node, that occurs about every 12 inches along its vines.

High praise for savior of the South

The kudzu cult had gained incredible momentum by the end of the war. A kudzu queen had been elected in Auburn, Alabama. Kudzu clubs had sprung up throughout the Southeast. Japan and China vied for the prestige of being the country of origin of the marvelous plant.

Channing Cope, agricultural editor for the *Atlanta Constitution*, and gentleman farmer, cried joyously, "Cotton isn't king here any more. Kudzu is king!"

The distinguished Georgia poet James Dickey wrote his poem *Kudzu* after 1955. It is dark and menacing, beginning:

Japan invades. Far Eastern vines
Run from the clay banks they are

Supposed to keep from eroding,
Up telephone poles,
Which rear, half out of leafage,
As though they would shriek
Like things smothered by their own

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Green, mindless, unkillable ghosts.
In Georgia, the legend says

That you must close your windows
At night to keep it out of the house.
The glass is tinged with green,
even so . . . *

Thus, sometime in the mid-1950s, the vine fell from favor. What went wrong in the kudzu Camelot? Farmers discovered kudzu could not stand up to intensive grazing. Although it cured well, kudzu still could not be harvested as easily as hay. Its value as an erosion control is still debated.

The reason for the demise of kudzu as a useful plant was the introduction of substitutes better suited as pasturage, soil revitalizers or erosion inhibitors. As retired SCS agent Paul Tabor says, "Kudzu was a victim of changing times."

Kudzu may or may not control erosion, but people who planted the vine found they had difficulty controlling it. It leaped fences and raced freely over embankments into forests and fields. By the time cultivation of kudzu had ceased, it had run wild. Now it has a permanent grasp on the land. It squats on the countryside and vacant city lots like an obese potentate.

Kudzu's severest critics are the U.S. Forest Service and the lumber industry because of the timber it kills. Kudzu grows loosely and doesn't actually strangle the trees, but its thick foliage smothers them by cutting off necessary sunlight. Whether by strangling or smothering, the results are the same—hundreds of thousands of dollars worth of good lumber and pulpwood destroyed.

Farmers now detest kudzu because it sneaks onto their property and damages crops and fruit and nut trees. There have even been rumors it has pulled off well covers and ensnared inattentive cows.

Telephone companies reportedly had trouble with kudzu pulling down poles, but overcame that difficulty by running their lines underground.

Power companies must spray kudzu at least once a year with herbicides to prevent the plant from slithering sometimes 80 feet up high-voltage towers. Still, the vine occasionally gets close enough to a wire or transformer to cause an electrical arc that goes to ground, producing extensive damage.

Like it or not, kudzu has become as much a part of the South as magnolias and mint juleps. A Southern rock band calls itself Kudzu and sings *Talkin' 'bout the Kudzu Vine.* A group of kudzu freaks made a film entitled *Kurse of the Kudzu Kreature,* which tells the moving tale of how the kudzu goddess wreaks her vengeance on an infidel who violates her sacred grotto. A now defunct underground newspaper in Birmingham, Alabama, was named *Kudzu.*

So what is kudzu's future?

Chemical controls exist which, if applied correctly and often enough, can eliminate the vegetal Medusa. But no massive eradication effort has been mounted. Except where it offers a clear and present danger, kudzu spreads unchecked.

One woman urged in a recent *Atlanta Constitution* editorial that the federal government pay the unemployed to dig up kudzu. But that might begin a dangerous 40-year cycle of planting and removing the vine at the taxpayers' expense.

Rufus Adair of the *Elberton* (Georgia) *Star* has proposed leaking a story that kudzu is hallucinogenic. "The hippies and the government would be racing to see who could get it first," he says wryly.

Dr. Jake Tinga, a horticulturist with the University of Georgia Agriculture College experiment stations, believes kudzu may once again serve a useful function. He suggested planting the vine in barrels on the roofs of new buildings and letting it cover the structure to serve as a natural coolant and to help reduce air-conditioning costs.

"But kudzu is too emotional an issue for that to be allowed," he says.

"Still, with the costs of fossil fuel, fertilizer, irrigation systems, and other agribusiness necessities steadily going up and up, farmers may start to reexamine some less sophisticated, less expensive methods of production. If properly managed, kudzu may yet have a place in agriculture," Tinga adds.

As for the question, "Whither kudzu?" one fact is certain—it is not going away.

Planted also for shade, kudzu swallows all in its path—including abandoned houses and cars.

* © 1963 by James Dickey, reprinted from *Poems 1957-1967* by permission, Wesleyan University Press. The lines first appeared in *The New Yorker.*

This handsome house was built in 1795 by Robert Peter for his son, who married George Washington's step-granddaughter. The father of his country here makes his last visit to the city in 1799.

By Rod MacLeish

An artist re-creates for us the capital's unremembered past

Robert Sivard paints buildings, now mostly demolished or defaced, and personalities that once enlivened the Washington scene

The year I was born, 1926, is the horizon of my life. On the far side of it there existed a whole Edwardian world of sense, vision and image that was very different from the texture of my own childhood and youth in the American Middle West.

I grew up amid the echoes and memories of that epoch which preceded me. Cultures do not abruptly die. They wither as their human occupants age, as recollection becomes gnarled, as their artifacts are moved into attics or sold to make way for newer fashions. It is a slow process, dispensing with everything

Peter house was torn down in 1962; its site is now an approach to a freeway (right).

Abraham Lincoln, seen inside, used to buy toys at A. Stuntz's shop. A bus terminal has replaced it.

animate and inanimate that characterized an era.

As a child, the quality of the quarter-century that came before me permeated my grandmother's house, Craigie Lea, which stood on the forested bluffs overlooking Lake Michigan. What endured from the far side of my horizon was transmitted to me in subtle assaults on my senses—the Victorian baroque of the house and stables, the aroma of oiled oak paneling and the musty basement storage rooms, cool and filled with homemade preserves. With a child's unwitting osmosis, I absorbed the pastoral reveries of 19th-century America from landscapes hung in gilt frames on the library and dining room walls.

I heard what my father had heard in *his* boyhood as I lay awake on autumn nights—the prairie wind combing doleful melody out of the tall, bare elms on its way to the lake, the curious sigh and throbbing of a pump house down in the ravine, the exhausted wash of little waves on the white sand beaches if the nights were still.

In the 1930s, Glencoe, Illinois, was in its last incarnation as an American village. Now it is a lump in the torrent of urban flow going north from Chicago. But during my childhood Glencoe had perimeters which defined it. Winter storms threw up great ice mountains on the lake shores, temporary geographies of cold caverns and slope. The village ended abruptly at the edge of the prairies.

My subsequent life has been lived far from that Illinois village where I heard, sensed and saw relics of what lay on the other side of my horizon. I have conceived other loves since then—for the wintry, Dickensian charm of Boston, for New York which embraced my young manhood with a sort of vibrant femininity, for the ruminative grandeur of London where I spent many years.

For the last ten years I have lived in Washington. It is hard to know how—or how much—I love this city. I am in the midst of it, it is in the midst of me. It is a city with which it is hard to make fundamental connection. Washington seems to have no evocative or symbolic past that relates to the present. The past here is impersonal, made up of common history, events, causes won or lost; it is a past embedded in the governmental continuum.

There are two reasons why, for so many of us who live here, there is no nourishing, recognizable human past in Washington.

The first reason is us, the arrangements we have made for our lives. For so many of us Washington is a reward, a climax of courses we have set for ourselves. We arrive here from somewhere else, exultant and eager to do great business in politics, government, law, journalism and the like. Washington is our setting, not our place. Its past doesn't matter. In Washington

Rod MacLeish, commentator for the Westinghouse Broadcasting Company, columnist and novelist, wrote on the national spirit in the July SMITHSONIAN.

Planners of Lincoln's assassination met in Mrs. Surratt's house. A Chinese grocery is now on the site.

The iceman was located where Justice Department now stands—and that's J. Edgar Hoover as a boy.

we are forever living the present, rehearsing the future.

The second force working to obliterate this city's human past is its monumental facade and everything symbolized by the facade. We who live here do the business we think great surrounded by monuments—Capitol Hill, the White House, the regal Treasury Building and the hideous, old-fashioned "modern" architecture of the State Department. You who visit Washington catch the monuments as your first and most durable impression of the city.

We build big here. Mr. Jefferson imprisoned in his Hellenic cage beside the tidal basin has been reproduced as a veritable skyscraper of a man. Mr. Lincoln broods upon us from his marble box, huge of hand, his tousled, carved head the approximate weight of a Cadillac. We make statuary and buildings big in Washington as a primitive symbol of contemporary importance or historic justification.

Monuments have as little to do with the real past as they do with the actual present. They are proclamations, great boasts in naked stone, which ignore the infinite complexity, minuteness, grandeur, tears and chromatic variations of the lives that made or witnessed whatever it is that the monuments commemorate. Augustus bragged that he found Rome a city of bricks and left it a city of marble. Commendable as architecture, perhaps, but there was more human memory and meaning in brick.

There are, it is true, a few people who persist in the enterprise of trying to give resurrection and breath to this city's very real and complex human past. The task isn't easy. The march of Washington grandeur and efforts to accommodate the city's ever-swelling population means the tearing down of those fragments of the past which evoke, inform and grow tendrils from Washington's former human presence into its depersonalized present.

Robert Sivard, whose pictures brighten these pages (and the walls of the Jane Haslem Gallery in Washington, where they will be on exhibition from December 4 through January 7), is a New York-born artist with a passion for the human components of cities. Cities, he says, "have purposes. They are places where people can congregate and be served." Washington, Sivard

Standing on steps of "Seminary Hospital" are Walt Whitman, Louisa May Alcott, John Burroughs.

Eleanor Roosevelt is the customer in this Georgetown toy shop,

adds, "needs to have its own identity now that it is quasi-independent. I feel very strongly that it needs to establish its own historic benchmarks."

Sivard's preoccupation with cities, their neighborhoods, people and histories, is indivisible from his own development as a painter. He believes that successful art must be multileveled—good as pictures and compositions, his paintings must also be anecdotal and relevant as long-term statements. He began painting Washington during World War II. Before settling in the capital permanently, he painted Geneva, Paris and Moscow, absorbing himself in their shops, side streets, vendors, hookers and passers-by. Like a good essayist, he uses description, humor, texture and thorough research to convey his sense of city neighborhoods past and present.

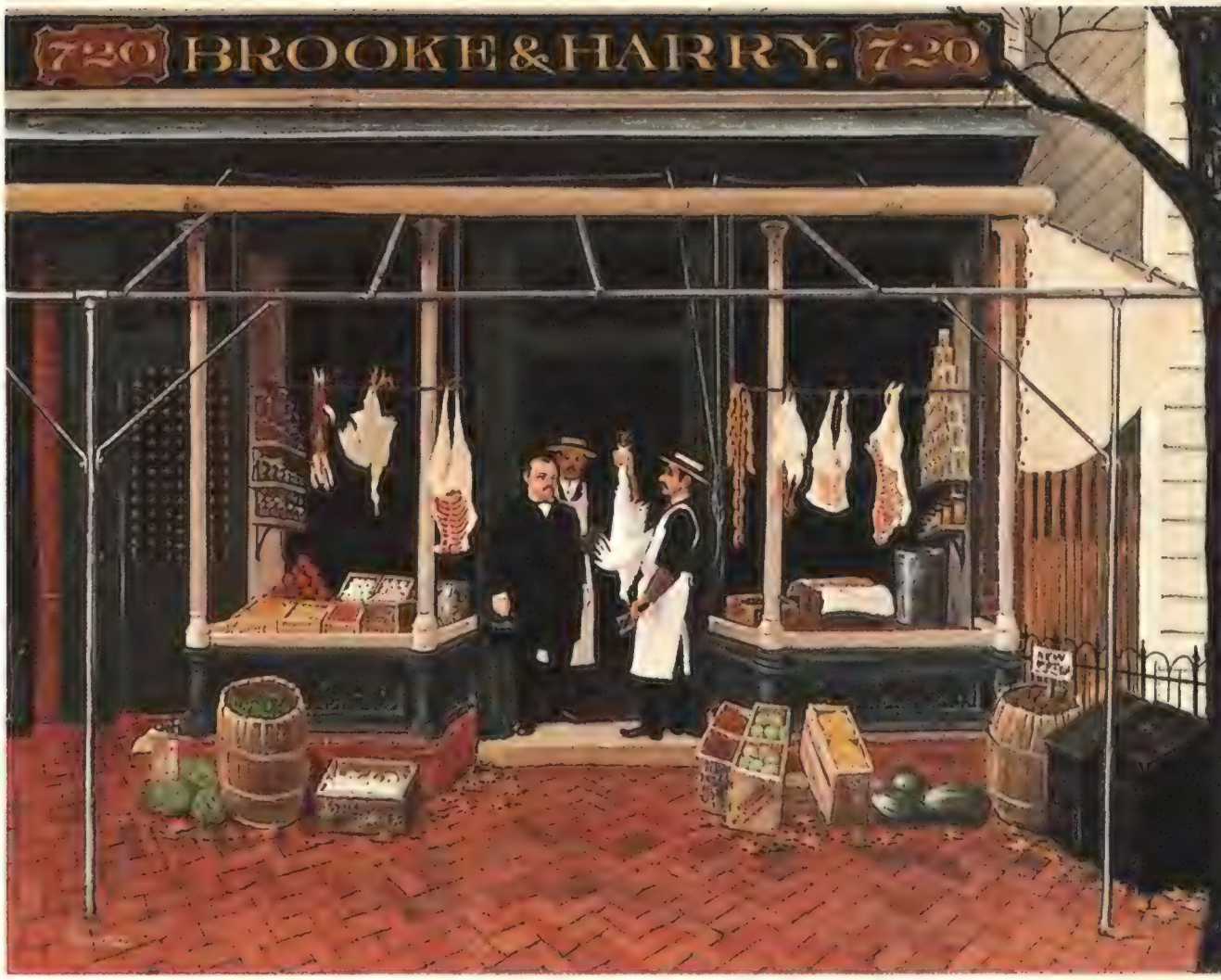
Sivard's farthest reach into Washington's past shows the Peter mansion (pp. 100-101), which stood at 2618 K Street until it was demolished in 1962 to make room for an expressway. The house was built by Robert Peter, the first mayor of Georgetown, for his son who married a step-granddaughter of George Washington. In Robert Sivard's painting, General Washington is making his last visit to the city which bears his name, just a few weeks before his death in 1799. The young Peters stand at the door to welcome him to their home.

Compare, for the tangibility of human presence, Sivard's picture of the A. Stuntz toy shop (p. 102) which once stood at 1207 New York Avenue, a few blocks from the White House. There really was a toy shop there (the ugly smear of a bus terminal has replaced it), and Abraham Lincoln used to call in to buy presents for Tad and his other children. Look closely at the man inside talking to the bald proprietor. It is Mr. Lincoln, alive, not imprisoned in monumental stone. Sivard likes toy shops. In another one, with a miniature red automobile out front (above), you can see Eleanor Roosevelt buying things.

Sivard does extensive research for his pictures. He studies old photographs, designs of toys, clothes and other objects contemporaneous with the eras that interest him. He also researches portraiture. He insists upon having real people in his paintings. "People in pictures make them a part of a personal expression," he says. "I can't look upon my paintings as still lifes."

In a picture of a Civil War officers' hospital we see Walt Whitman, Louisa May Alcott and John Burroughs, the naturalist, standing on the steps and brick sidewalk (above). All three worked in the hospital dur-

which was probably built in 1796.
It is now a Chinese restaurant.



President Grover Cleveland selects a goose about 1898. The shop was razed for parking in 1962.

ing the War between the States. The two little girls at the right side of the main group are Sivard's allegorical tribute to Louisa May. They are little women.

The Washington scenes portrayed by Robert Sivard lie on the far side of the city's present life. They depict a place composed of its occupants and of arrangements made to accommodate the fact of living, instead of the enshrinement of past glories, present policies and intentions for the future.

That earlier Washington seen in these paintings is a biopsy of historic reality. Of course there were monuments then, of course the city swarmed with the hopeful doers of great work. In the late 19th century Washington reeked of corruption and arrogance. Senators of the cut of Simon Cameron, Roscoe Conkling and Mark Hanna bought their seats and made an art form of that particular political disdain which holds that the public is lucky to have the occupants of offices—not the other way around.

The White House, in the last quarter of the previous century, was occupied, mostly, by men whose lack of distinction was *their* principle monument. Oddly enough, Rutherford B. Hayes, who achieved office through the most questionable Presidential election in our history, was not one of the White House drabs of the period. A temperance reformer from Fremont, Ohio, Hayes began the long process of dismantling the spoils system which was one of the principle sources of political corruption.

Then, as now, there was a large black population in Washington which seemed to be sequestered from the main purpose of the city. Robert Sivard has painted the storefront offices of *The Bee* which was the leading black newspaper here from 1880 to 1920. Published by an attorney named W. Calvin Chase, *The Bee* printed exhortations to violence against whites in language that would land a contemporary editor in jail. Few people bothered Mr. Chase, however, because few whites ever read his newspaper. The role of blacks *has* improved in Washington with the passage of time, largely because of Washington's growing independence from its rather rigid and remote management by the federal government.

Doubtless, in that earlier Washington, the drains were bad, fire took a worse toll than it does now and there was little relief from the horrid climate which smothers this city in crushing, moist heat for a good part of the year (in the 1840s, a French diplomat went home one night and shot himself because he couldn't bear the protracted hot spell then in progress).

Nor is present-day Washington a totally dreary landscape of concrete, stone and habitation that is careless of the place inhabited. The city has pockets of great charm—Cleveland Park, parts of Georgetown, the Kalorama Circle area and neighborhoods, like the one close to the Supreme Court, that are being revived in a sort of villagelike style. There are beautiful walks along the old Chesapeake and Ohio Canal that parallels the river, you can watch polo and rugby in the parks on Sunday afternoons, fly kites on the Ellipse and cycle through the deep ravine of Rock Creek Park.

The Kennedy Center for the Performing Arts symbolizes the cultural broadening of Washington. This is now a theater, opera and dance town—not only at the Kennedy Center, but at a dozen or more theaters in the District and at Wolf Trap in the Virginia countryside during the summer and early autumn. There is a sizable literary community here, there are those splendid art collections, and the National Symphony is becoming a first-rate orchestra.

Yet the derisive title given the radical students of France in the late Sixties—*génération sans souvenir*—fits so many who live in Washington in the middle Seventies. Being a generation without memory, we do not interest ourselves in the evolution of our city. We have no sense of what lay on the far side of the horizon of our time here. There is nothing of Washington's past for us to cherish to the degree that we insist upon its preservation.

So, the ugly overpasses cross above the site of the Peter house; those gritty bus terminals stand where Mr. Lincoln once bought toys for Tad. Across the street from where The Great Falls Ice Company (p. 103) used to be, the new FBI building squats in impersonal unloveliness, named for the small boy who stands in the forefront of Sivard's painting of the ice company—J. Edgar Hoover.

Is the obliteration of Washington's past different in any way from the fate of other American cities? I think it is. In Philadelphia, where the center city has been restored, great thought and energy have gone into the preservation of Society Hill—a section of narrow

Trolley passing Smithsonian castle carries, left to right, Spencer F. Baird, second Secretary of the Smithsonian; Edward Miner Gallaudet, cofounder of Gallaudet College; Interior Secretary Carl Schurz; Robert Todd Lincoln, Secretary of War. Driver is Robert Truax, present-day curator of prints and photographs at the Columbia Historical Society.

streets, charming old houses and exquisite little gardens. Society Hill is part of the collective memory of Philadelphians. In that fact lay its salvation.

Washington has little or no collective memory to protect the grace and charms of its previous eras. Washington was intended for uses beyond those of living and the doing of ordinary business. It was—and is—supposed to be an embodiment of ideas and purposes. The ideas and purposes are, in turn, supposed to be splendid. Therefore, Washington increasingly succumbs to monumentalism and to that modernity of reconstruction which is useful but lifeless. Few of us protest. It is as if no one had lived here before us.

Robert Sivard and a few others are trying to acquaint Americans with their capital's past. It is a hard task, because so many of us brought other pasts with us and are, therefore, indifferent to the one that is being extinguished all around us.

In that indifference we are losing what Washington once was—which is another way of saying that we are losing a part of what Washington is. Heraclitus' river of time keeps flowing, but its carried flotsam is a reminder of what preceded us. Without knowing about our preface, we cannot know fully what we are.

That may be this celebrated city's fate—to live forever in the restless present, bereft of any citizen sense of the qualities of life that produced it. The American Augustan age goes on erecting monuments to itself.

And this Rome, like the first one, is forgetting its mud and bricks where the human genesis of a city lies.

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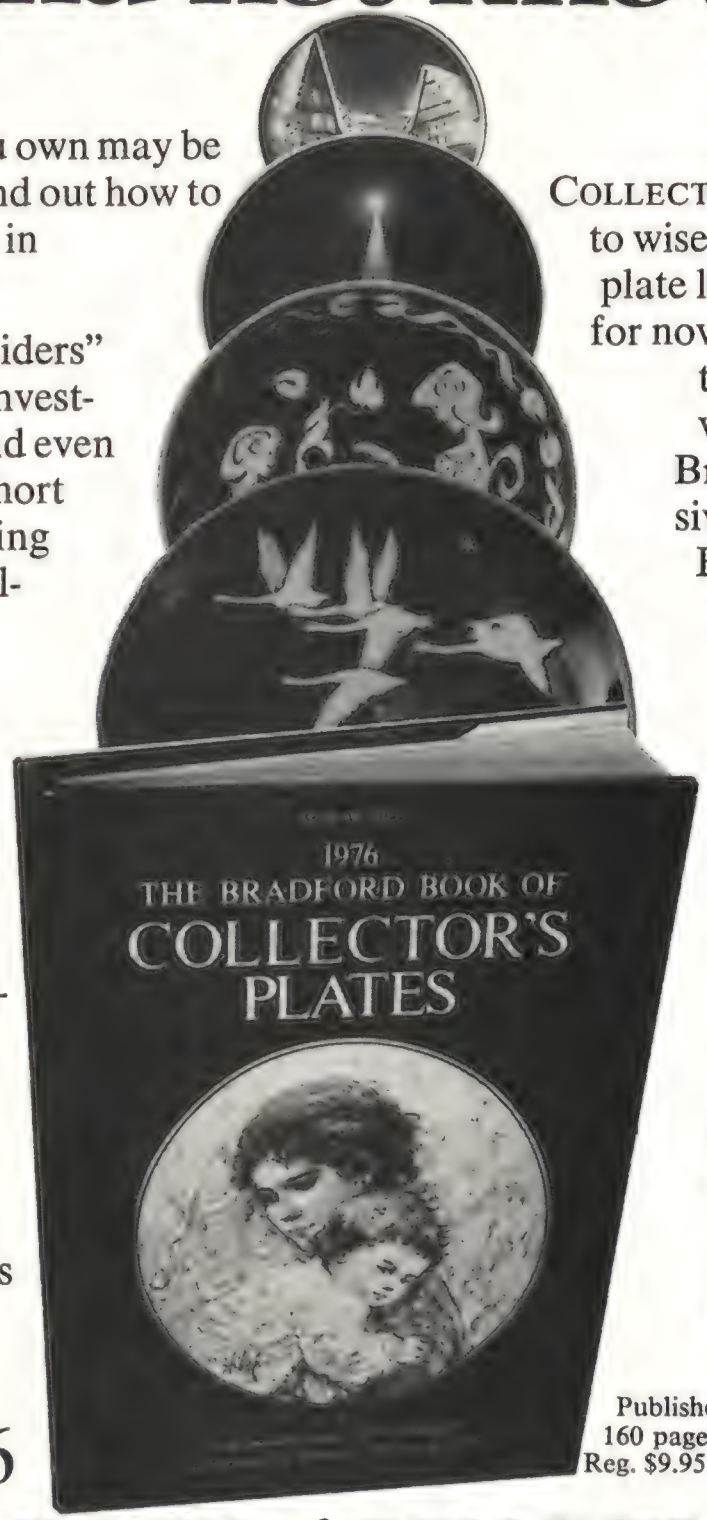

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By William W. Fitzhugh
as told to Jane D. Scholl

Tribute to explorer lost in Labrador

Leader of Smithsonian expedition on which Anne Abraham was lost recalls her special archaeological contributions, her sense of joy

It was, to say the least, an unusual request. The young Harvard senior, bound for a summer's dig in Labrador with a Smithsonian Institution expedition, wanted to know if he could bring along two of his younger sisters, ages only 18 and 14. Their parents would be glad to pay their expenses. Startled, I thought a bit, and then said yes—if he, Ted Abraham, would take full responsibility for them.

That was 1971. I had been studying the Maritime Archaic Indian culture which flourished in Labrador 4,000 years ago, and planned to explore a site at Rattlers Bight on the central coast of Labrador. (There are no snakes there—it's too cold. Surf running in across a rocky reef at the entrance to the bay makes a rattling sound, and a "bight" is simply a cove.)

I have found my best crews to be a mixture of archaeology students and interested amateurs. The nonprofessionals come in with wide-eyed eagerness. It's all new, all exciting to them; they are full of questions and are often more observant than professionals, who have been trained to look for certain kinds of things. The amateurs see things you've never thought of before, and broaden the scientific basis of the work. But we had never had a 14-year-old.

Anne, however, proved to be far more mature in

Dr. Fitzhugh, chairman of the Department of Anthropology at Smithsonian's National Museum of Natural History, has been involved with archaeological research in Labrador since 1968.

A pensive Anne Abraham, wearing her favorite frog pin, was photographed last spring by her father.

Her face decorated with red ocher, Anne kneels beside Indian grave she excavated. Tools are slate axes.

every way than one would expect of a girl of her age. She was remarkably resourceful and observant. She was a delight in camp—cheerful and willing to help my wife, Lynne, with the housekeeping chores, which set the tone for the rest of the crew, and in the scientific work of surveys and excavation she outperformed even graduate students. Over the past six years, Anne contributed more to the understanding of the archaeology of Labrador than any other member of my crew.

She was also socially adept and totally absorbed with the local people we met. She had a knack for drawing them out and made hundreds of friends among the Indians and the Eskimos; a native-language memorial to Anne, ERKAUMAVLUGO, called Labrador her "second home."

As Dr. Porter M. Kier, Director of the Smithsonian's National Museum of Natural History, says: "Our scientists are often assisted in their field work by amateurs. This experience makes a contribution toward the development of student careers, and we are benefitted by the spark of their enthusiasm and the sharing with them of their joy of discovery."

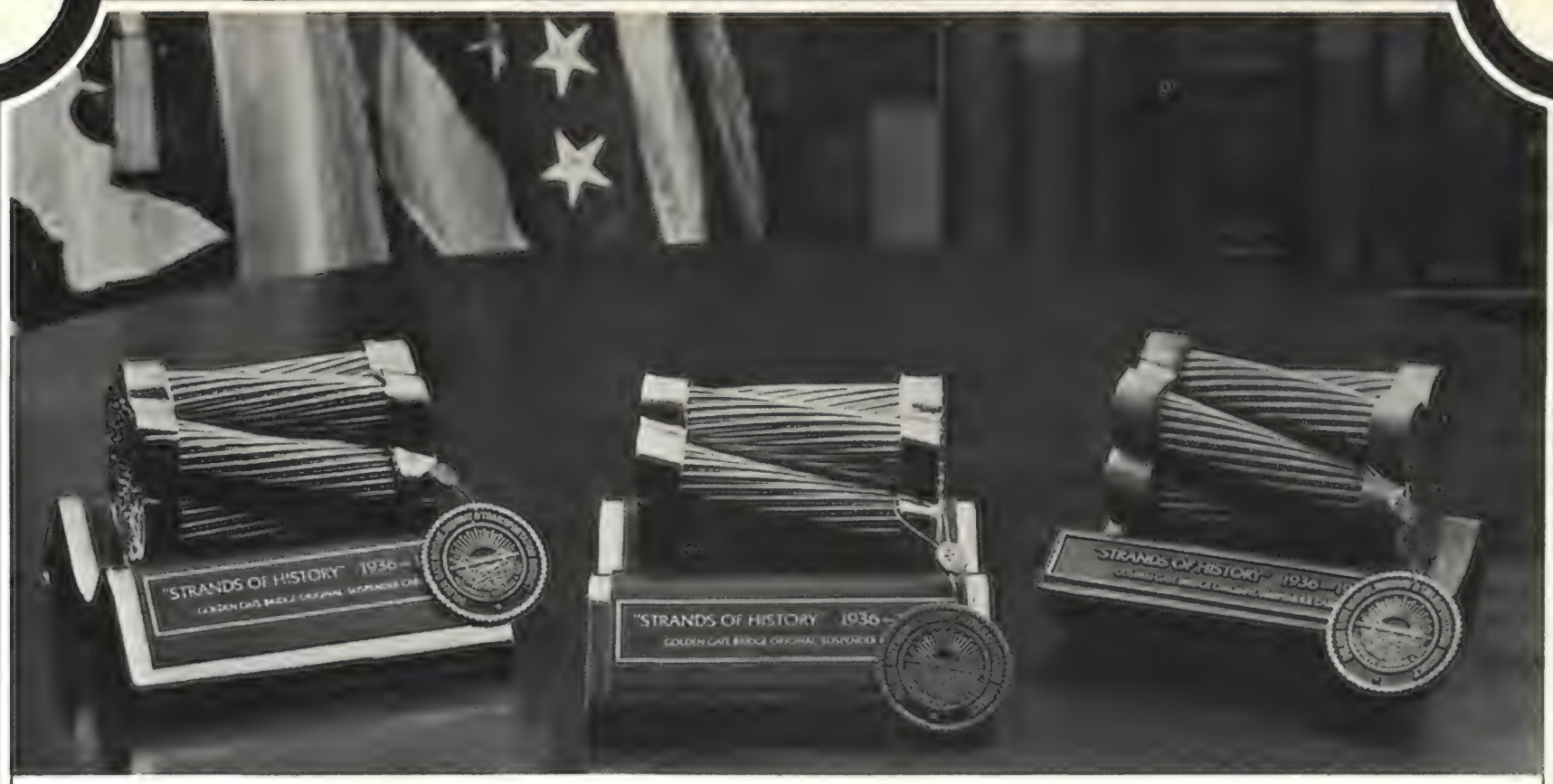
Anne Abraham was so captivated by the land and the work that she returned to Labrador every summer, and so often lingered into the fall that I stopped trying to make reservations for her return home to Washington. She also helped out in my laboratory during the winters. She became a close personal friend of my family and on many an Easter morning the children woke to discover in the garden her treasures of jelly beans, coloring books and games.

Questions without answers

On August 6, 1976, while trying to find a shortcut to a promising archaeological site at Ramah Bay on the north coast of Labrador, she simply disappeared. Members of the expedition's crew, Anne's brother Ted (now a medical student at Harvard), the Royal Canadian Mounted Police and others conducted an intensive, but fruitless, week-long search. A few footprints were the only clues. But were they hers? Did she slip and fall into the icy water, or was she cut off by the tide? There probably never will be answers.

In that first season in 1971, Anne had turned up spectacular finds, very rare artifacts which were new types for the culture we were investigating. Some were sketched, very professionally, in Anne's notebook—along with pen and crayon drawings of the wildflowers, birds, fish and mammals so abundant in Labrador. Her labels are a blend of scientific accuracy and exuberance: "Whale—grampus ahoy! . . . basalt intrusion . . . Tuchialik Bay—oh love . . . Natsatuk quarries—quartz area . . . Cape Harrison—wow!"

Anne grew up with science, art and music. Her



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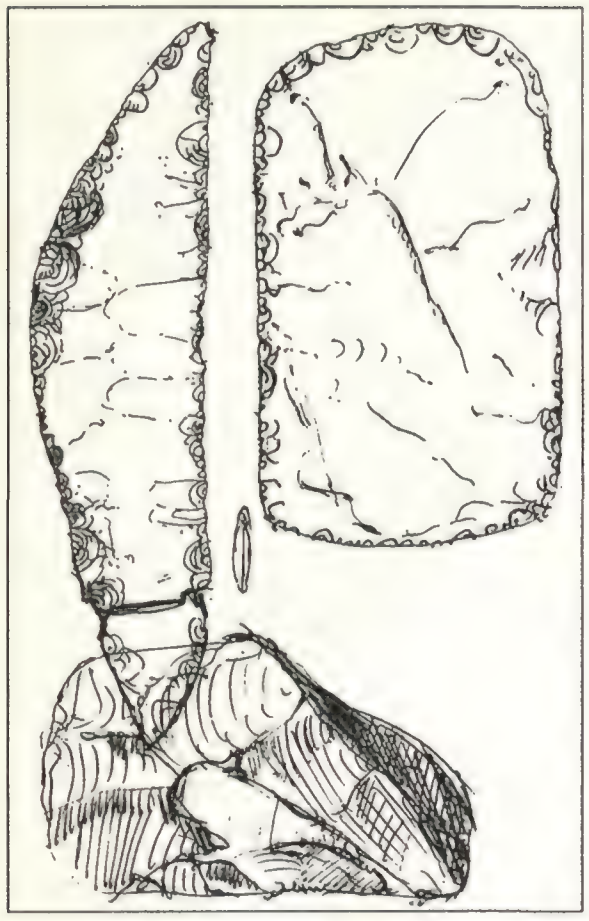

Anne's 1971 notes show important finds, semilunar knife (left) and biface ax.

father, Dr. George Abraham, is a physicist at the Naval Research Laboratory in Washington. Her mother, Hilda, has been a docent at the National Collection of Fine Arts for years, conducting gallery tours, and has been active in many other educational and cultural groups. Their four children, like their father, are accomplished musicians.

The Abrahams over the years have taken many family camping trips. Anne's first mountain climb was as a toddler of three, on New Hampshire's Mount Washington. Last winter she spent three months as an apprentice in the Discovery, Inc., program, helping instruct Washington area groups in rock-climbing techniques and wilderness survival.

She had taken a year off from her studies at George Washington University, trying to decide whether to work toward a degree in anthropology or switch to a conservatory and a career as a professional musician. A violin student for 12 years, Anne had played with the D.C. Youth Orchestra for three.

Expedition members were encouraged to take along their musical instruments; Anne hardly needed urging to bring her violin. After a ten-hour day excavating a site, she often spent the evening playing music. Sometimes she would look up the Eskimo organist at the Moravian church in Nain, the small coastal village near the 1974-76 base camp at Natsatuk, and they would play in the empty church for hours. "First we played a concerto . . . I didn't want to stop . . ." she noted in her diary.

I don't know when she ever slept. She was a vital person and played her violin the way she wrote, hiked and pursued archaeology—with a driving need to be alive, to feel and share, and to communicate. Anne kept up a pace ten times that of the rest of us. She would go like that for several days, and then suddenly fall asleep in her excavation square or on a sunny hillside.

"Anne had very broad interests," her mother says. "There was so much she wanted to do, so many things that interested her. Music was important to her, as was art—although she had little formal training in it—and science. She had a certain gift for seeing things and being curious, using her own perspective in putting things together. She loved life and living."

Labrador is often characterized to outsiders in Jacques Cartier's famous quote as "the land God gave to Cain." But to me and my crews it is a pure, grandiose country, stark and elemental and wild, softened by wildflowers and lingering golden twilights, with clumps of dwarf birch and willow, scattered spruce, myriad birds and animals, spectacular views and pulsating northern lights. Even in August there are snow patches on the land and icebergs in the ocean. The water is so clear that you can watch the rock cod and the shadow of your boat gliding over the bottom 25 feet below.

Violin and viola duets by Anne and her brother Ted enlivened Arctic evenings.

The most important find in 1975 was an Indian cemetery at Rattlers Bight. Anne excavated a grave that contained a bundled human skeleton buried with wal-

Waving bright balloons, Anne helps Josh Fitzhugh celebrate his second birthday.

Anne steers expedition boat *Tunuyak* on a trip to Nain for base supplies.

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rus tusk axes, harpoons, finely made tools of polished slate and a huge sheet of mica which may have been used as a mirror—all smothered in thick ceremonial red ocher. I remember her trembling with excitement, brushing the ocher away and seeing herself as the first reflection thrown back by the mica in 4,000 years; she paused, wondering at the previous image so long darkened, and then dipped her hands into the ocher, impishly smearing some on her face to break the spell.

Many of the Rattlers Bight artifacts were fashioned from Ramah chert, a remarkably hard and translucent flintlike stone so prized by the prehistoric Indians that some pieces were traded all the way to Florida. Ramah chert was known to outcrop along a 30-mile stretch of the Labrador coast near Ramah Bay, 175 miles north of the Smithsonian base camp, but no one had ever found its quarry. Pinpointing the source would provide valuable information on population movements, communication and trading, so we made locating it a 1976 priority. For the task I chose Anne Abraham and Dr. R. Michael Gramly, an archaeologist from the State University of

Excavation crew that discovered ancient Eskimo site at Dog Bight includes Anne (left), Valerie Grant and Stephen Loring, with Ben Fitzhugh, age eight.

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Rugged mountain lies between Ramah Bay (upper left) and chert quarry (depression, right). Anne Abraham vanished from this quarry area.

New York at Stony Brook. His specialty is the geology of prehistoric rock quarries from which materials for tools were taken.

As a team, they complemented each other beautifully. Both were experienced in operating from field camps in rugged country. Anne was performing as an extremely competent archaeologist even though she had no degree. She knew how to recognize cultures from the types of tools found and how to discover sites. Besides, Anne was a strong person physically, with lots of stamina, and I had to have somebody working with Mike who could keep up with him.

In order to identify with scientific precision the location from which Ramah chert had been quarried, it was necessary to take samples from different places in the outcrop, record them carefully and later analyze their chemical and physical characteristics in the laboratory. That was Mike's job. Since Anne was becoming more and more interested in the geological aspects of archaeology, it was a chance for her to work closely with someone who could instruct her and perhaps help determine a future career.

Anne kept her usual careful diary,

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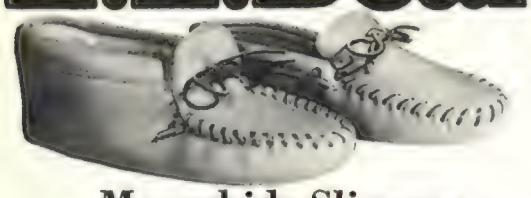

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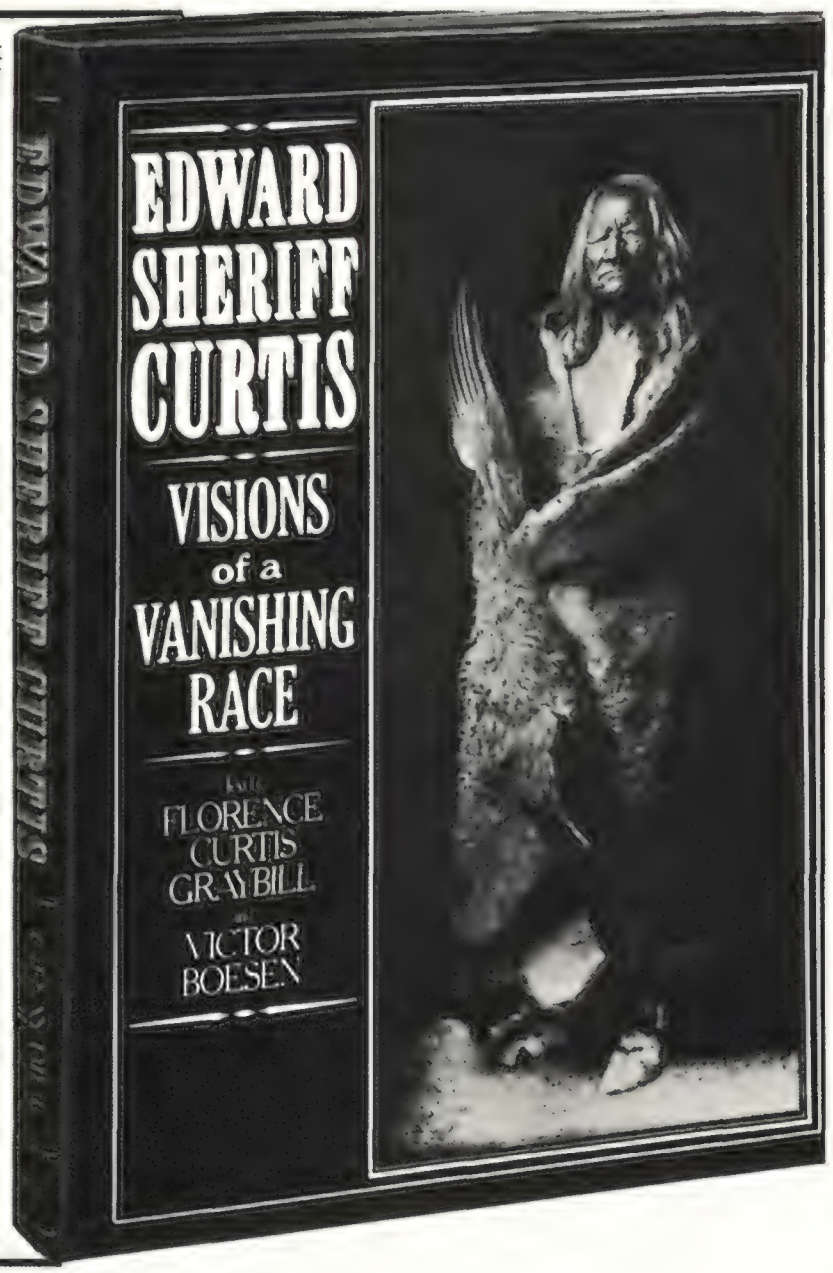

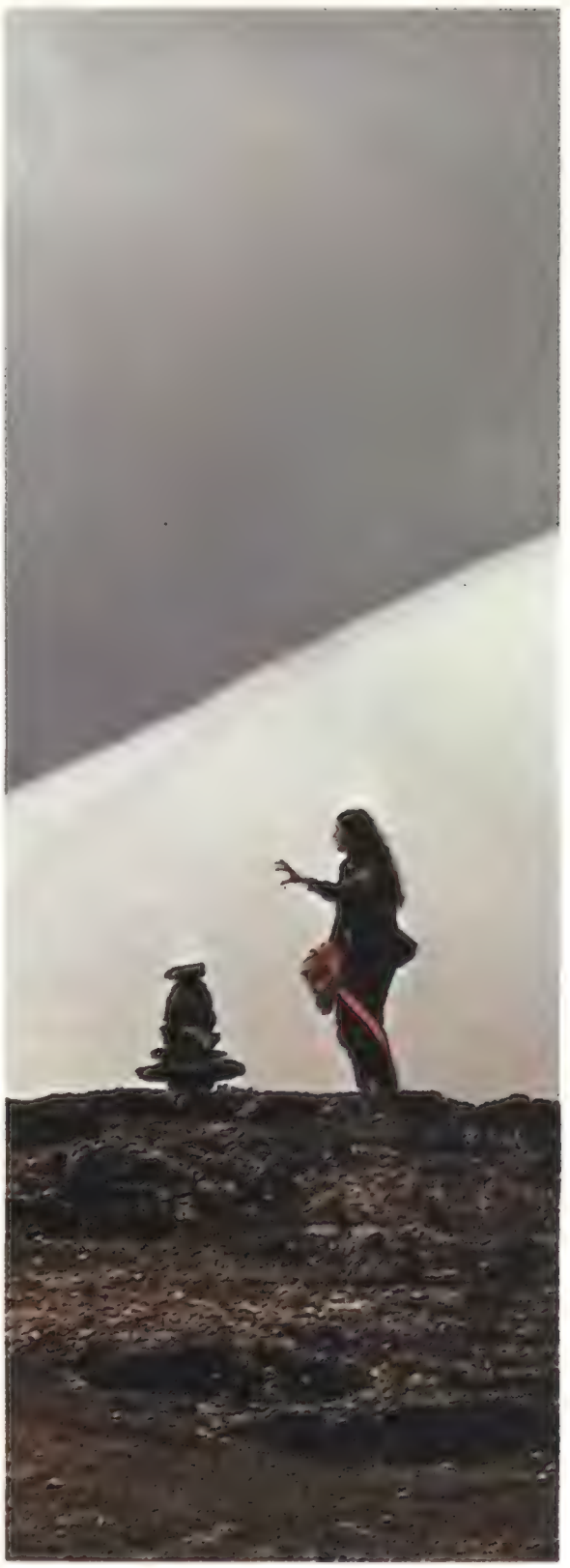

Anne is silhouetted against Labrador fog beside a modern rock cairn.

noting the plentiful—and not always desirable—fauna: ". . . the black flies have found us. . . ." She paid attention to birds, mammals and natural forces. "The late afternoon rain was electrical in storm power. . . . Caribou on my way back watched me, almost as though hesitating for an introduction. What a nice acquaintance to have! Earlier a sparrow pointed & called to me that everything was OK. I knew it then and felt it all." Another day: "On my way up hill from water I flushed some ptarmigan. I was startled by it. What an interesting art of escape: to wait until the last moment and

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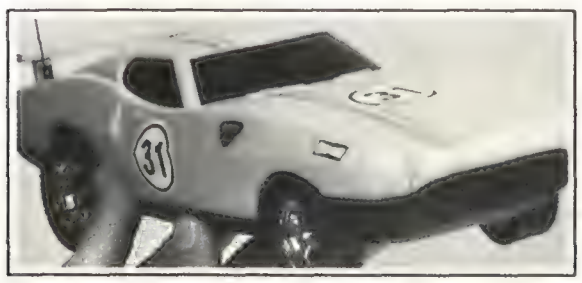

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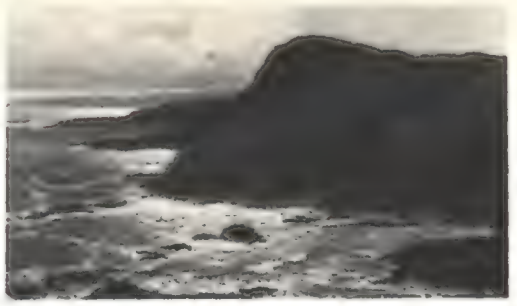

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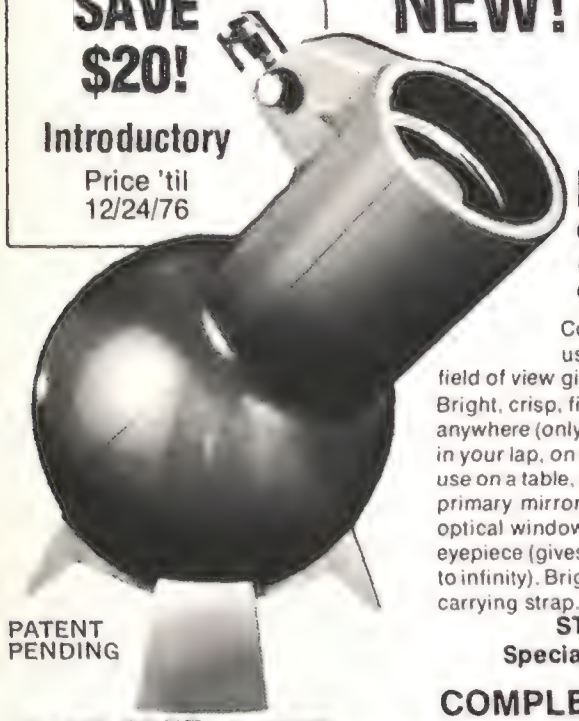

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get the enemy off guard by sudden commotion. I thought about ways that I might do this. . . ."

A few days after their arrival Anne wrote, "I . . . looked down to find some ramah-looking boulder. . . . Indeed it was ramah and as I walked up the hill I found more & more & more. We had at last a quarry. All that day we explored to see how much was there. All different colors from black to white with some banding. We collected artifacts. In one place Mike dug down to see how deep flaking was and turned up a lovely egg-shaped hammerstone. Such chance . . . 'Tis true you really have to hoof it to find things. . . . We collected a lot of material—finding more hammerstones and more large biface blanks, tips, and rounded bases . . . The time went unrecognized. We were so excited with all the findings. . . ."

It was an extremely important discovery. The quarry is huge, one-quarter of a mile long, and solid chert—their footsteps clanged musically on the rock flakes as they crossed it.

Returning to camp, Anne found that "It was a long pull up the cliff. I took my time because the rock, so crumbly, is dangerous . . . truly continual concentration is necessary. I stop often though to see what is around me."

An observant naturalist, Anne commented on everything: "I took some pictures and was enjoying the fairyland hills across the bay. . . . I downclimbed the falls and came into another world, alone. So

Painted with feathers from molting Canada geese, Anne's watercolor shows

many grasshoppers in this area. So many asters, dandelion, daisy types & grasses. Lots of butterflies. . . . I stopped when I heard a clicking below me. . . . Soon the flight of a white breasted bird came to investigate me. . . . I ate some blueberries, getting hungry. . . . In a small pool by a brook we stopped to catch small spotted trout. We got a dozen by barricading the fish with rock walls into smaller pools. They were such a sweet fish when fried. We were appreciative. . . . At last this evening I have gone out and watched the sunset. . . . I wish I had paints, for the hills and pink bright clouds all weighed on my eyes."

The two decided to look for a short-cut around a 2,000-foot-high mountain to another possible quarry site they wanted to explore. If they could find a shore route, or a way along the shoreside of the hill, it would save them six hours of hiking. Mike checked out the shore while Anne started up the slope. A few minutes later he was back, but Anne was nowhere to be seen.

The little Moravian church in Nain, where Anne had played the violin, was jampacked and overflowing for her memorial service. And in Accokeek, Maryland, family, friends and colleagues strained the capacity of Christ Church to hear some of her favorite music and poems, as well as excerpts from her diary—a moving tribute to a young woman considered by many of her friends to be larger than life.

expedition base camp on Natsatuk Island, overlooking September Harbor.

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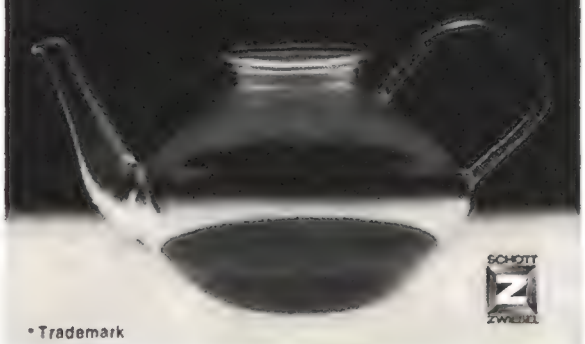

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The omnibus sleigh, drawn by six horses, was brought out to replace the trolley when it snowed in New York. Will Schneiderman rode in it as a boy and recalls boarding at the corner of Fulton and Broadway, shown above.

By William Kitay

Rich miniature sleighs: all but the jingle bells

A Bronx woodcarver makes authentic replicas, carving them in exact detail from single blocks of wood

The artist has worked at his kitchen table almost daily for 30 years.

Will Schneiderman is a man of two worlds. One is the world of today in which he has raised a family, is active in community affairs and is production manager for a New York shirt manufacturer.

The other is a world he enters for two or three hours almost every evening, a bygone world in which the winter air is cold, crisp and free of pollution, and the only noise is the muted clop-clop of horses' hooves and the jingle of bells on their collars as they race ahead of sleighs gliding quietly over snow-covered streets.

Schneiderman, 68, is a self-taught wood sculptor of miniature replicas of sleighs. He fashions each figure—about seven-to-ten inches long—from a single block of wood and copies it accurately from authentic sleighs and paintings and prints he finds in museums and archives throughout the world.

As he works, meticulously carving every detail, Schneiderman imagines himself a part of that time in which the sleigh played an important part in the lives of people, appreciating the design of the sleigh and the purpose for which it was intended, even visualizing how he himself might have used it.

Before Schneiderman starts on a model, he tries to learn as much as he can about the period in which it was used. He recently wrote Queen Juliana of the Netherlands about a photograph showing her as a little girl seated in a gilded royal sleigh with her family. He asked how old was she at the time? Where did the sleigh come from? Where is it now? He got the answers. The photograph was taken December 18, 1917. The Queen, a young princess at the time, was eight years old. The sleigh was a gift from her grandmother, Queen Mother Emma. It was seized by the Germans during the war and taken to the Russian front and was never seen again.

Each of his replicas shows the affection he puts into his craft. "It is a love for the work itself," he explains. "I find it very relaxing after a day in the office. I keep my FM radio playing softly in the background. I may sit here for three hours, but when I put my knives down it seems to me that only about five or ten minutes have passed."

Mr. Kitay, medical writer and editor, is a first cousin of the artist.

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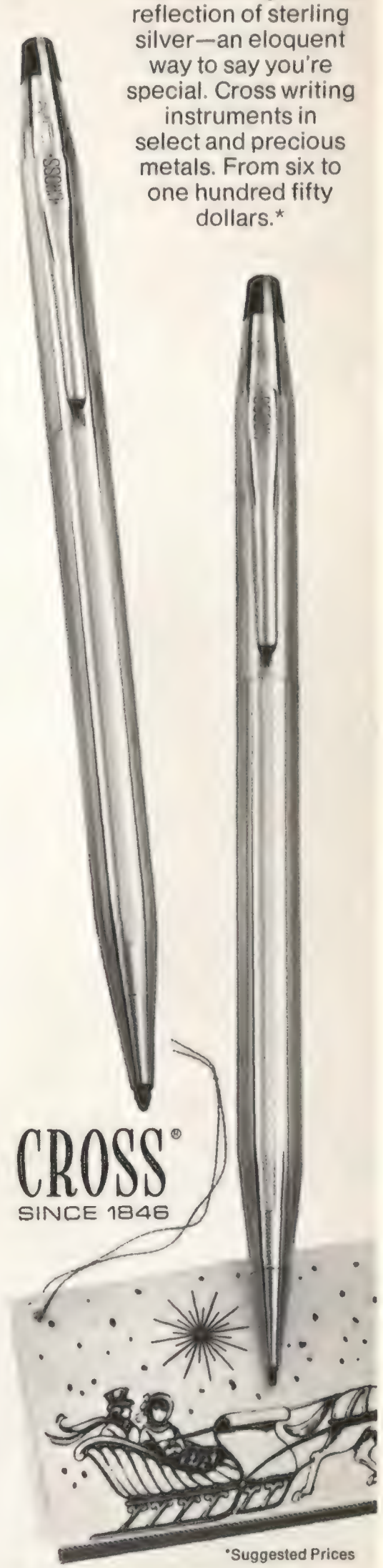

Dutch perambulator of the 17th century contains oil scenes on its side panels.

Every miniature sleigh has a story of its own, either about how it was used in its time or how some intricate part was carved in its design. There is, for example, the 19th-century Russian utility or work sleigh that was used in Siberia. Simple in structure, yet rugged, it was meant primarily for hauling lumber. On Sundays, market days and festive occasions, it was easily adapted for family use by placing on top a tightly woven, waist-high wicker basket in which people could sit or stand. The sleigh that Schneiderman carved has the large wicker basket in place. The basket, which took many months to carve, is so perfectly executed that persons seeing the object for the first time are certain the basket was woven out of wicker. The intricate pattern of the weaving is so precise that Schneiderman strained his eyes making it and couldn't work for several weeks.

Scrollwork and other decorations are often so tiny and exacting that Schneiderman must take his work outdoors into natural light. This he reserves for weekends, when he moves to a bench in Van Cortlandt Park in the Bronx, across the street from his apartment house. Neighbors sometimes gather round to watch him work. They have learned to watch in silence, for fear of distracting him. Not only does the work require utmost concentration, but also great care, because the small carving knives Schneiderman uses are so sharp that the slightest slip could cause him to cut his fingers.

One day the sculptor was putting the finishing touches to an 18th-century Swedish sleigh, the original of which is in the Nordiska Museum in Stockholm. An onlooker asked how he planned to complete the interior. Schneiderman replied that he would probably line it with something. The man said he was in the fabric business, and the next day he brought samples of expensive velvets from which Schneiderman selected the sleigh's upholstery. Another onlooker, a printer, learning that Schneiderman intended to cover the exterior of the sleigh with gold paint, brought 22-karat gold leaf and showed Schneiderman how to apply it with a camel's hair brush.

White ermine lines the interior of an American cutter built in 1880.

Schneiderman reserves the privilege of criticism only for his wife of 45 years, Yetta. "Yetta will often have a suggestion of how to improve it," he says. "She is usually right."

He recalls the time he finished a 19th-century American dog sleigh shaped like an Indian canoe. It was used by traders throughout the Midwest, especially in Ohio and Indiana. Mounted between the runners at the rear of the sleigh were two cabinets in which the trader carried his wares. Schneiderman carved the outline of the cabinets and suggested the presence of doors. "If they are meant to be cabinets," Yetta told him, "they should be cabinets and they should have doors that can be opened and shut." Schneiderman hollowed out the cabinets and fitted them with hinged doors.

The family coat of arms adorns an early sleigh from Sweden.

Schneiderman is now at work on the Queen Juliana sleigh. It is one of his most ambitious projects, and it may take two or three years to complete. The sleigh has the forepart of a dragon as its figurehead. Schneiderman says there was a period when not only real and imaginary animal motifs decorated sleighs, but entire sleighs were often carved in the shape of animals. Wealthy families competed with one another for the services of some of Europe's finest carvers.

Already finished is the long, arched, scaly neck of the dragon. Schneiderman does not rough out his work. He designs the figure as he goes along. He has now begun to work on the dragon's underbelly, which forms the front of the sleigh. The delicate undercarriage with its gracefully flowing runners will be left until last, for carving this part too soon might

Late 18th-century Swedish sleigh is decorated with 22-karat gold leaf.

A rider had to straddle the seat of this Swiss "fantasy dog sleigh."

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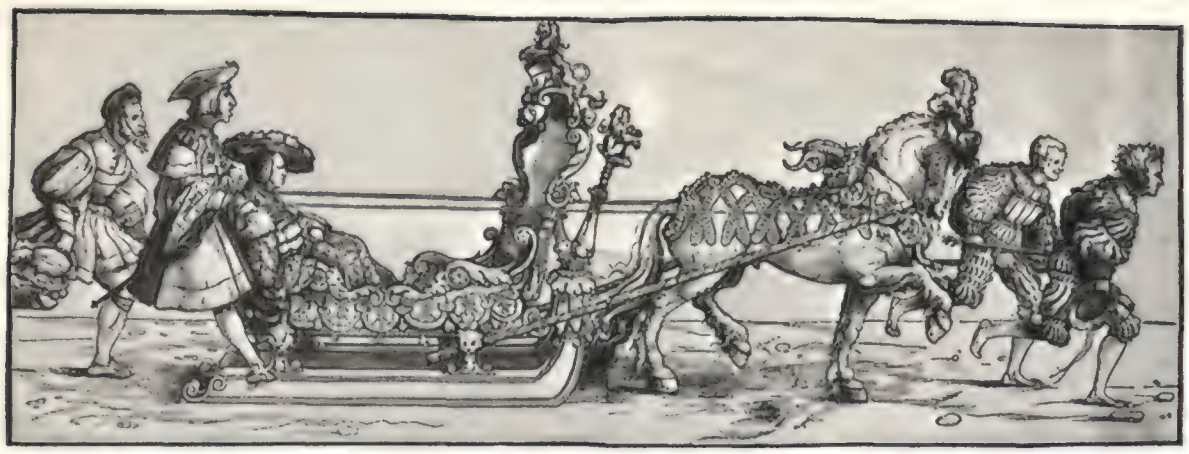

In a 16th-century manuscript, King Ferdinand of Spain is pictured in a sleigh used by him and Queen Isabella. Its replica in miniature was Schneiderman's first attempt at carving sleighs.

cause it to break and ruin the whole job.

Schneiderman's introduction to his craft occurred one summer weekend in 1947 when he found a Boy Scout knife on a New York street. At a building site he picked up a piece of discarded molding and began to chip away at it. The result was a foot-long totem pole full of varied figures and faces, intricately intertwined curlicues and a small wooden ball that rolled freely inside the cage in which it was carved. He wondered what else he could do with a piece of wood. As a boy he had always been interested in miniature objects, carving faces and animals out of pieces of chalk and peach pits.

His next carving was that of a small figure, an old-time sailor. Schneiderman has always had an appreciation for detail. He grew up near the Metropolitan Museum of Art in New York and as a boy spent hours wandering through its massive rooms, studying pieces of sculpture and paintings.

"I guess I should have been a full-time sculptor or a painter," he says. "But times were hard, and all everyone talked about was getting into some kind of work. It seemed all of my friends were studying

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accounting, and so I studied accounting."

Schneiderman considered many subjects for his carving, but it was the memory of a Currier & Ives print of a winter scene showing a horse pulling an American cutter sleigh full of laughing, happy riders that caught his interest. "The flowing lines of the sleigh resemble the shape of a graceful swan, and I thought it was beautiful," he recalls. He had found the subject for what has turned out to be a lifetime of sculpturing in wood.

Schneiderman could not locate a copy of that print, but he did turn up a 16th-century sketch of a sleigh used by King Ferdinand and Queen Isabella of Spain. The sketch fascinated him, and he decided to make it the subject of his first carving. He sought every possible bit of information about Ferdinand and Isabella and the Spain of that period.

He selected a five-inch square block of sugar pine, because he found the wood soft and easy to carve. Today he uses poplar that is at least 200 years old, or mahogany. For precise and delicate carving, he finds the harder wood more suitable, although somewhat more difficult with which to work. Besides, aged wood

This Russian sleigh transported heavy loads in the 19th century. The very intricate basket seems woven of wicker.

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Before taking a knife to the wood, Schneiderman carefully studied the photograph and visualized the shape that would emerge. He wanted to position the sleigh so that he would carve with the grain. He also wanted to minimize stress that might damage the more delicate parts. Though now he is experienced, Schneiderman still mentally blocks out each project in the same way.

Schneiderman worked on his first sleigh for six weeks. Every evening he sat at the kitchen table and carved for three or four hours. The next morning, at breakfast, he placed the partly carved block on the table. As he ate, he studied his work of the previous evening. He still does this.

For his next models, Schneiderman visited the museums and libraries of New York in search of designs. He wrote to similar institutions in other states and countries. Slowly at first, curators and librarians began to respond. The Smithsonian Institution sent photographs of three sleighs: the American cutter and an 18th-century American one-horse sleigh, both in the collection at that time, and a 17th-century Dutch perambulator sleigh with four panels of miniature oil paintings from the Cooper Union collection, now part of the Smithsonian. Schneiderman went on to carve all three.

One model in Schneiderman's collection is of a sleigh in which he remembers riding as a boy (p. 120). This is the omnibus used in New York City from the 1860s

Three years of delicate handwork went into elaborate French dragon sleigh.

to about 1920. The long, oversized open sleigh resembles a trolley car, but without roof or sides. It was pulled by six horses and ran the regular trolley routes in the city during the winter. In those days snow was not cleared off city streets. Schneiderman made his model from an original print (p. 120), which shows the omnibus sleigh passing the bustling corner of Broadway and Fulton Streets in downtown Manhattan.

For his next project he plans the Russian troika, a light open sleigh drawn by three horses abreast. It seats three, side by side, with a driver in front. The center horse wears a yoke, an arched, wooden frame over its head in lieu of a collar. The 19th-century Siberian utility sleigh is the only other one in his collection that also has a yoke.

Until now, the miniature sleighs have been on display in wall cabinets in Schneiderman's apartment. It had never occurred to him that anyone but his family and friends would be interested. But last winter the collection was on display at the Hudson River Museum in Yonkers. This winter it can be viewed through January 2 at the Kodak Exhibition Galleries in New York City.

Does the sculptor think his work may someday influence a youngster to take up the craft? Schneiderman doesn't think so. He believes carving in miniature is a lost art, as lost as the art of the woodcarvers of old who had made the original sleighs. "Carving in miniature," says Schneiderman, "takes time and patience. People today have neither."

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Book reviews

Underfoot: An Everyday Guide to Exploring the American Past
David Weitzman
(Scribner's $12.95)

"History is where you find it," the author of this field manual for historical sleuths says, "and for you it may begin the moment you step out your front door, go down the street a ways, and turn the corner." In a word, the past *is* underfoot—everywhere.

Underfoot is a "How to . . ." book, a step-by-step guide to finding, preserving, recording and interpreting historical evidence in old photograph albums, attics, graveyards, and in the reminiscences of relatives and neighbors. It is written on the reasonable premise that the possibilities are there for every man to be the chronicler of his family's and his community's history (this was also the subject of the Institution's "Kin and Communities" program, described in "Around the Mall," SMITHSONIAN, April 1976).

Weitzman's intelligently written and generously illustrated invitation to reconstruct the intimate records that flesh out the national history is compelling. The methodology he teaches is sound and relatively simple to follow. He lays down rules for collecting oral history and explains how to operate a tape recorder, suggests camera techniques for photographing documents and buildings, and gives clues to the proper care of aging prints and negatives.

We learn how to use the graveyard as a museum of historical demography; how to read newspaper advertisements and census returns as social and economic history; how to piece together local

Historic family photo (from the book)

history in neglected corners of the public library; how to construct a family tree; how to appreciate what is fine and valuable in the architecture of familiar buildings and cultivate a connoisseurship of medicine bottles, artisans' tools, great-grandmother's embroidery and other familiar objects.

Weitzman includes examples of personal interviews, selections from local histories, the recollections of immigrants, and memoirs collected from subjects who are "ordinary" only in the sense that their stories would likely have been overlooked by professional historians. Some passages are unintentional poetry, testifying not only to the diversity of the American experience, but to the strength and tolerance of the American people as well.

Underfoot is a book meant to be used, not to be read and put away. Once read

Read this and cry.

Froilan lives in the highlands of Guatemala in a one-room hut with dirt floors and no sanitary facilities. Labor there is so cheap that, for men like Froilan's father, hard work and long hours still mean a life of poverty. But now life is changing for Froilan.

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through, however, it could convince us that each family, each community, has its special saga worth starting our own research project to preserve. But why? Perhaps to make a shared experience of the memories of an older generation. There is a particular urgency and poignancy in the history of years about to slip out of living memory and beyond recovery, when all that we can know about them will be secondhand at best. Perhaps we feel a need to restore some of the bonds loosened by the mobility we have acquired as a nation at the cost of self-contained communities and cities composed of coherent neighborhoods. Perhaps we know intuitively that roots make us more humane.

Even professional historians must admit that the classroom and the book are never the principal means by which cultural values are assimilated and history is learned. The earliest historians were the old men of the family, the clan, the village—and they were poets, not scholars. Our first history lessons may still have been taught us on a grandfather's lap. But, with time, curiosity lapses, and collective experience counts for less.

Read *Underfoot* with caution, then. It is a provocation to rekindle the tribal memory in us all. At the very least, having read it, we will be more aware of where we step.

—*Robert Rinehart*
Historian in the Foreign Area Studies program, The American University

White on Red: Images of the American Indian
Edited by Nancy B. Black and Bette S. Weidman
(Kennikat Press, $12.95)

The Vanishing White Man
Stan Steiner
(Harper & Row, $10.95)

Indian Country
(The League of Women Voters Education Fund, $2.95)

Few peoples of the world have been studied and written about more than American Indians. The torrent of books, articles and essays that began with the first European explorers to the New World continues abundantly to this day, thanks to a seemingly insatiable interest

in Native American culture. Indeed, whether by buff or scholar, regardless of quality, books on Indians frequently find a receptive audience. Happily, the three works presented here are worthy of careful examination.

White on Red, edited by Nancy B. Black and Bette S. Weidman, is an anthology of writings by whites about Indians, spanning the establishment of Jamestown Colony in 1607 to the Massacre at Wounded Knee almost three centuries later. The editors were not concerned with historical accuracy, but rather with the image of the Indians as projected in the popular literature of white society. Hence, excerpts from romantic novels, poetry and plays are balanced against a captivity narrative as well as commentaries by early Colonists and explorers.

For the most part, the readings are taken from the classics of American literature—Smith's *General Historie,* Mather's *Magnalia Christi Americana,* Parkman's *Conspiracy of Pontiac,* Longfellow's *Song of Hiawatha,* Melville's *Moby Dick.*

Although the essays are fascinating reading in themselves, they are especially useful for the telling insights they provide about the many varieties of white attitudes toward American Indians at the time they were written.

Another anthology of sorts is *The Vanishing White Man* by Stan Steiner, a Santa Fe writer commenting about the energy crisis and its impact on contemporary Native Americans who control some of the nation's most important energy resources. Steiner presents the opinions of a wide range of individuals—so-called Indian experts as well as expert Indians, miners, politicians, ranchers, tribal leaders—and offers some disturbing conclusions that are shared and voiced by many Native Americans: the white man in his relentless search for energy is destroying the American West, but in so doing he is destroying himself. Choked by smog and greed, the whites will eventually be forced to retreat, unable to exist in a land devoid of water, coal and fertility. When that occurs, the Indians will once again possess their ancestral lands. The Indians may own the resources, but they are unable to prevent what to them is simply the last in a long series of government rip-offs. The Indian attitude is well stated by a pueblo leader who remarked

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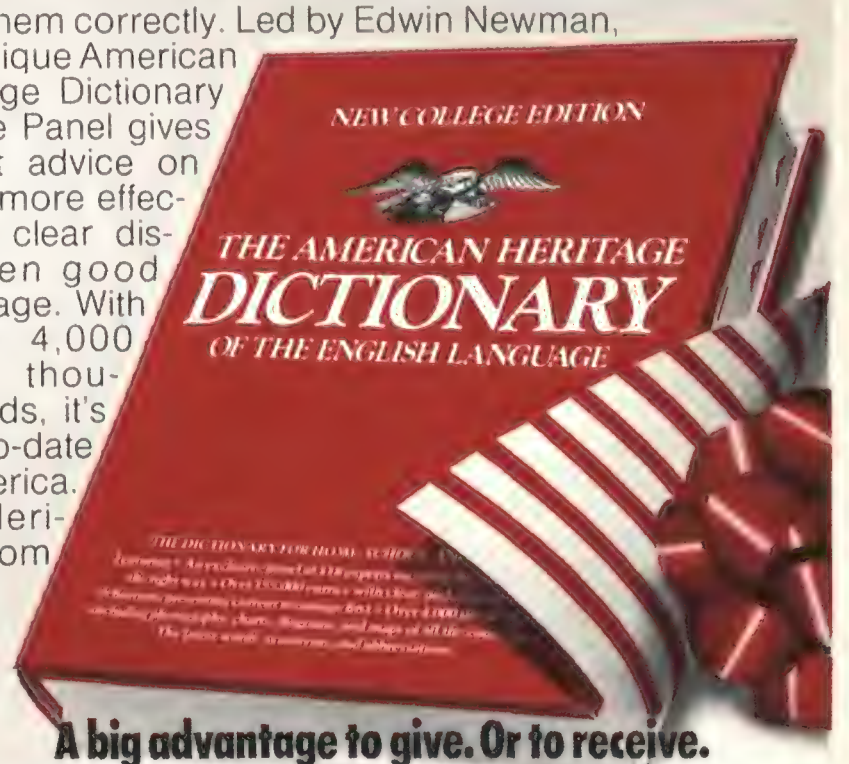

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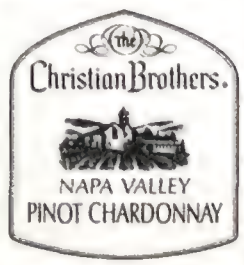

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with powerful sardonicism: "People in power have always stolen from Indian People. But I must hand it to the present United States government; never has any government gone to so much expense and into so much detail in order to steal something [energy resources] from somebody. I guess that is the American way."

Indian Country, published by the League of Women Voters, is an inexpensive booklet. It is crammed with information about federal programs for Indians and current issues affecting them, as well as historical background. In short, it is an American Indian encyclopedia, focusing on federal programs and activities.
—Herman J. Viola
Director, National Anthropological Archives, Smithsonian Institution, and author of *The Indian Legacy of Charles Bird King*

Charles Darwin
John Chancellor
(Taplinger, $13.95)

This book is about a famous man. And, as everyone knows, the "conventional wisdom" is no more reliable about famous men than it is about anything. At best, such wisdom is riddled with easy-to-remember half-truths; at worst, well. . . .

For example, it is not true that Wordsworth was a nature lover. Or that Ted Williams hates all sports writers. Sammy Davis jr. does not like to box.

Things are the same with Charles Darwin (1809-1882). There is no book called *The Origin of* the *Species,* which supposedly tells us how we all came to be monkeys' nephews and which gave Gene Kelly and Spencer Tracy, H. L. Mencken and Clarence Darrow such field days in film, print and even real life. The book's real title is: *The Origin of Species by Means of Natural Selection.* And it deals with the ways plants and animals respond to threats in their environment by adopting certain characteristics that help them survive various dangers. The species that do survive have genetic leverage over those that perish. Take, for example, some species of moths that are active 24 hours a day. They are consistently tender morsels for local birds, whereas those moths that hang in the weeds until sundown have a much higher chance for survival. It takes a while, but the night-flying species of moths eventually dominate the

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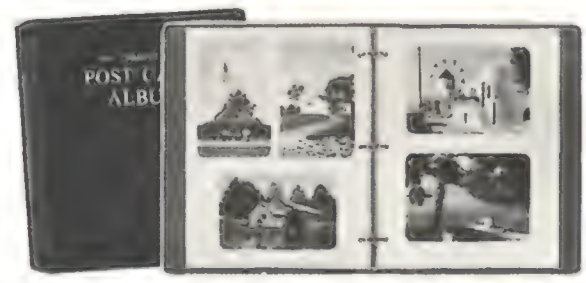

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breed. The day flyers, along with their genes and chromosomes, have been depleted.

In truth, most of the games of genetic leverage were played out eons ago. It simply took the persistence and intelligence of Charles Darwin to see that they could still be going on.

The problem is that, if improved and adapted species were the result, it is also possible that there could have been new species that evolved, so to speak, from lower species. And it is probable that it was just that inference that created all the furor over "evolution."

Another of the impacted areas of Darwin folklore, which John Chancellor does a good job of lancing in his well-illustrated and clearly written book, is the notion that the voyage of HMS *Beagle,* Darwin's five-year (1831-1836) circumnavigation to survey the South American coast, with stopovers in some British possessions, was solely responsible for Darwin's blinding inspiration. In fact, the best thing that could be said for the trip was that it afforded Darwin large doses of reflective sea time, when there was little else to do but read and brood over Lyell's *Principles of Geology.*

Charles Lyell and his revolutionary ideas were beginning to affect Man's notions about how the world was created—not with a bang, but with a slow, simmering disregard for the passage of time. Thus, when Darwin was faced in his geological digs with the remains of a paleontological cemetery at Bahía Blanca, below Buenos Aires, he noticed and questioned those telltale resemblances between extinct and living species: between the Megatherium and the sloth, between the Scelidotherium and the armadillo. And he was nearing an answer to those questions. He wrote in his notebook: "This wonderful relationship in the same continent between the dead and the living will, I do not doubt, hereafter throw more light on the appearance of organic beings on earth and their disappearance from it."

Still, for all its attractiveness, the concept came slowly from Darwin. The *Beagle* returned in 1836; *The Journal of Researches into the Geology and Natural History of the Various Countries Visited by HMS Beagle* appeared in 1839 and quickly became a best seller as a travel book rather than a biological guidebook.

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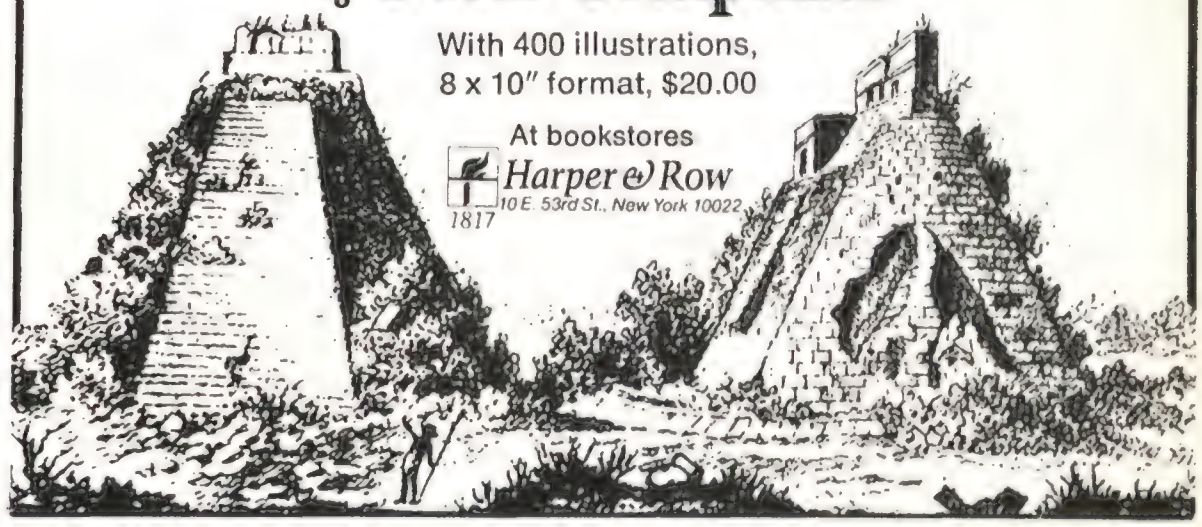

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Only in 1859 did *The Origin* appear—and that apparently could have been many more years in the coming; its publication was suddenly brought about because another naturalist and friend of Darwin, Alfred Russel Wallace, was about to publish a similar theory. Still, it was a painful epiphany for Darwin. He wrote to a colleague: "As an honest man I must tell you that I have come to the heterodox conclusion that there are no such things as independently created species—that species are only strongly defined varieties. I know that this will make you despise me."

That diffidence in the face of a world he expected to be hostile to his theories resulted in the persona we recognize as Darwin's to this day: a retired country gentleman, an impeccably patient experimenter, and a long-suffering invalid.

In 1842, Darwin and his family moved to Kent and gave up cities completely. There he undertook lengthy experiments: his definitive work on barnacles took from 1846 to 1854, and he studied the effect of a layer of chalk on a patch of loam from 1842 to 1871 (an experiment described in *Vegetable Mould and Earth-worms).* There, in Down House, he also spent a lifetime fighting off the effects of Chagas' disease, a parasitic infection he contracted in South America.

Unfortunately, there are some who feel the disease was a psychosomatic reaction to his having slain the Faith of his fathers. Nothing could be further from the truth.

Darwin himself was certain that his theory would go further toward ennobling the Creator than any theory based on cosmic prestidigitation.

In fact, it is this positive assertion that triumphantly concludes *The Origin:*

"There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved."

—Michael Olmert
Free-lance writer and critic

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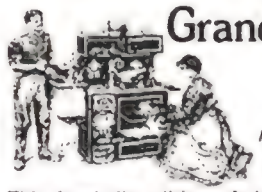

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Statement of ownership, management and circulation (required by 39 U.S.C. 3685) of Smithsonian published monthly at the Smithsonian Institution, 900 Jefferson Drive, Washington, D. C. 20560 for October 1, 1976. General business offices of the publisher are located at 900 Jefferson Drive, Washington, D. C. 20560. Name and address of publisher and editor is Edward K. Thompson, 900 Jefferson Drive, Washington, D. C. 20560. Owner is: Smithsonian Institution, 900 Jefferson Drive, Washington, D. C. 20560. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: None. The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes have not changed during preceding 12 months (Section 132.122, PSM). The average number of copies of each issue during the preceding 12 months are: (A) Total number of copies printed: 1,284,203; (B) Paid circulation: (1) Sales through dealers and carriers, street vendors and counter sales: 1,350; (2) Mail subscriptions: 1,265,809; (C) Total paid circulation: 1,267,159; (D) Free distribution by mail, carrier or other means: 4,813; (E) Total distribution: 1,271,972; (F) Office use, left-over, unaccounted, spoiled after printing: 12,231; (G) Total: 1,284,203. The actual number of copies of single issue published nearest to filing date are: (A) Total number of copies printed: 1,392,909; (B) Paid circulation: (1) Sales through dealers and carriers, street vendors and counter sales: 873; (2) Mail subscriptions: 1,376,151; (C) Total paid circulation: 1,377,024; (D) Free distribution by mail carrier or other means: 6,160; (E) Total distribution: 1,383,184; (F) Office use, left-over, unaccounted, spoiled after printing: 9,725; (G) Total: 1,392,909. I certify that the statements made by me above are correct and complete.

(signed) Joseph J. Bonsignore
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Additional reading

Army Corps of Engineers (p. 40)

"Boondoggle" by Paul Gibson, *Forbes,* Fall 1975

The Corps in Perspective Since 1775 published by the U.S. Army Corps of Engineers for the American Society of Civil Engineers (Washington), 1976

The Diligent Destroyers by George Laycock, Doubleday & Company, Inc., 1970

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"Court Ruling Expands ACE Control of Waters" by William Hickman, *Architectural Record,* June 1975

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Woodrow Wilson, Life and Letters: War Leader, 1917-1918 (vol. 7) by Ray Stannard Baker, Greenwood Press, Inc., 1968

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Contemporary Art with Wood: Creative Technique and Appreciation by Donna Z. Meilach, Crown Publishers, Inc., 1965

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Smithsonian highlights

Museum of History and Technology
"Person to Person" is an exhibition in commemoration of the 100th anniversary of the invention of the telephone. It includes unique items from the museum's collection illustrating how the technology of interpersonal communication has changed and how these changes have affected our view of the world around us. Included are experimental telegraphs of Morse, Edison and Hughes and experimental telephones of Bell and others—opens December 15.

National Portrait Gallery
"Not A Model Boy" is a small exhibit on Mark Twain's Tom Sawyer coinciding with the 100th anniversary of the book's publication—opens December 9.

Hirshhorn Museum and Sculpture Garden
"A Hirshhorn Holiday" carries out the theme of visual illusion with films, magicians, mimes, tours and treasure hunts for children accompanied by adults, December 4, 10 A.M. to 2 P.M.

"The Artist, the Critic and the Public" is a free lecture by John Canaday, December 8, 8 P.M., Hirshhorn Auditorium.

"Peter Plagens: Works on Paper" is a loan exhibition of 33 works in mixed media by the West Coast artist and author of *Sunshine Muse: Contemporary Art on the West Coast*—opens December 2.

"E.E. Cummings: The Poet as Artist" features the museum's collection of drawings and paintings by this foremost American poet—opens December 2.

Anacostia Neighborhood Museum
The museum's black Santa arrives December 13, 10 A.M. at Martin Luther King jr. Avenue and W Street, S.E.

Renwick Gallery
"Stitch Pictures" presents needlework pictures by Ethel Mohamed. The extraordinarily colorful, detailed works depict subjects from life in Belzoni, Mississippi, to scenes of the Revolutionary War—opens December 3.

"The Object as Poet" examines the relationship of poetry and the poetic image to objects made by artist-craftsmen. Of the 60 three-dimensional objects, some incorporate words or lines of poetry in or on their surface—opens December 15.

National Collection of Fine Arts
"John White Alexander (1856-1915)" is the first comprehensive exhibition of Alexander's work in 60 years. The show includes 50 watercolors, drawings, illustrations and oils—opens December 22.

A new permanent gallery featuring the John Gellatly collection (see SMITHSONIAN, July 1971) has opened to the public. It features a variety of 100 European and Asiatic objects ranging from a bronze ritual vessel of the Shang dynasty (11th century B.C.) to a diamond-studded enamel box which Catherine the Great presented to Gregory Orlov.

Divisions of Performing Arts and Musical Instruments
- The Jazz Heritage series presents "Small Group Ellington," directed by Bob Wilber, December 5, 4:30 P.M. free workshop, 8 P.M. concert, Baird Auditorium, Museum of Natural History.
- The Smithsonian Chamber Players present music for Advent and Christmas, December 6, 8:30 P.M., Hall of Musical Instruments, Museum of History and Technology.
- Les Paul is the featured artist in the Country Guitar series, December 12, 8 P.M., Baird Auditorium.
- David Bean plays works from Haydn, Mozart, Beethoven, Schubert, Chopin and Liszt on the grand piano used by Paderewski in an 1892 nationwide concert tour, December 13, 8:30 P.M., Hall of Musical Instruments, Museum of History and Technology.

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When visiting the Smithsonian, members are invited to register at the Associates Reception Desk in the castle on the Mall. Here, a special orientation packet may be obtained from a staff prepared to assist you from 10 A.M. to 4 P.M., seven days a week. A lounge area is also located in the Smithsonian castle.

Luncheon is available to Associates and their guests in The Court, across the Mall in the Museum of Natural History. Beer, wine and an ample buffet menu are served in this new restaurant seven days a week. Membership cards are required.

If you are planning a trip to the Smithsonian, write for information to: Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560. Travel information about the original 13 states may be obtained by writing the Museum Reference Service at the same address.

Associates are entitled to discounts at the museum shops (see below). If you have misplaced your membership card, the Reception Center will issue a new one upon presentation of your SMITHSONIAN magazine mailing label. For inquiries, call (202) 381-6264.

Holidays in the museum shops

Each museum shop carries items relating to the collections in that museum. Around Christmastime, special gifts, toys, tree ornaments and cards from around the world are available in the shops. Associates are entitled to a ten percent discount with a membership card (Please note: discount privileges do not apply to the National Zoo, most items at the National Gallery of Art or certain items in the Freer Gallery) and a 20 percent discount on purchases of Smithsonian Press books.

Winter museum hours

The Smithsonian museums are open, 10 A.M. to 5:30 P.M. daily. The Zoo is open from 9 A.M. to 4:30 P.M. and the Anacostia Neighborhood Museum from 10 A.M. to 6 P. M. weekdays and 1 to 6 P.M. weekends. **All Smithsonian museums are closed on Christmas Day.**

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Three different categories of travel are available to Smithsonian Associates. For a brief description of Foreign Study, Domestic Study and Foreign Charter tours, see the July issue. Tours are announced exclusively in SMITHSONIAN. Write addresses below for additional information about a specific trip.

Domestic Study Tours

Christmas at the Smithsonian—December 10-12: Fifth annual weekend featuring the National Air and Space Museum, highlighted by a tree-trimming party and dinners in the Arts and Industries "Centennial" Building and castle • **South Texas Wildlife**—January 22-30: Explore three beautiful and varied wildlife refuges at Aransas, Laguna Atascosa and Santa Ana • **Baja Whale Watch**—February 10-18: Observe gray whales and marine life from San Diego to San Ignacio Lagoon aboard a chartered sport-fishing boat; study the natural history of the Baja coast and islands • **Yellowstone in the Snow**—February 25-March 6: Rainbows in the mist of Old Faithful and wintering herds of elk and buffalo create a photographer's paradise • **New Orleans and Acadiana**—March 7-14: Learn about the history, architecture, cuisine and jazz of New Orleans and the French influence on Cajun country • **San Antonio Festival**—April 21-29: Enjoy this colorful celebration highlighting the blend of Anglo and Spanish cultures in this historic city. Also visit La Grange and Austin • **Washington "Anytime" Weekend**—Visit the nation's capital and tour the original Smithsonian building. Spend two nights at Loew's L'Enfant Plaza Hotel (reservations required ten days prior to weekend) • Write Associates Travel Program, A & I 1270B, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5635 for information.

Foreign Study Tours

Greater Antilles—January 3-10: Cruise aboard the motor yacht *Argonaut* and enjoy midwinter sun and rest; study architecture and historic preservation in Old San Juan, Santo Domingo and three Haitian ports; Port Antonio and the countryside around Montego Bay, with talks by Dr. Richard Howland and others • **Far East**—February 11-March 7: Singapore, plus a nine-day Indonesian cruise; in-depth tour of art and archaeology in Thailand and a visit to Hong Kong, with lectures by Mrs. Kenneth Young • **Jordan-Jerusalem**—March 8-31: Archaeology in Jordan for one week; two weeks of historic sites in and near Jerusalem (accommodations and study at St. George's College) • **Russia**—June 1-22: Emphasizing art history in Georgia and Armenia • **Baltic, Norway and the Fjords**—July 30-August 18: Cruise on the *Argonaut* to Sweden, Estonia, Russia (Leningrad), Finland; spend a week in the fjords of Norway • **The Isles of Britain**—August 19-September 3: Cruise aboard the *Argonaut* from Edinburgh at Festival time to the Orkney, Hebrides and Scilly islands, Northumbria, northern Scotland and Wales • Write Miss Bliss Schumann, Foreign Study Tours, SI 123, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-5520 for information.

Foreign Charter Tours

Mexico City and Yucatan—January 1-12, February 5-16, November 5-16 or November 19-30: A study program in Mexico City concentrating on Aztec and Toltec cultures; visits to the Mayan ruins of Chichén-Itzá, Uxmal and Palenque (originates in Mexico City) • **Australia and Tahiti**—April 11-May 5: Sydney, Melbourne, Canberra and Papeete; "lifeseeing" seminars and excursions into the countryside; choice of side trip to Great Barrier Reef, or Adelaide overland to Alice Springs, or Tasmania and Southern Australia (originates in San Francisco) • **Istanbul and Asiatic Turkey***—April 18-May 2 or October 10-24: An adventure tour including a five-day program on Byzantine and Ottoman Istanbul, followed by choice of travel seminars to Aegean Turkey, Cappadocia or the southern coast • **Russia***—May 9-23 or October 3-17: The Bolshoi, Moscow Circus, Hermitage; schools, factories and housing in Moscow, Leningrad and Tallinn • **Poland***—May 16-30: "Lifeseeing" and museum seminars in Warsaw; travel seminars to Mazurian Lakes, Gdansk, Malbork in northern Poland or Sandomierz, Zakopane and Cracow in southern Poland • **Paris and Provence***—May 23-June 6, September 26-October 10: Paris plus Avignon, Arles, Nîmes and Aix-en-Provence; museum seminars at the Louvre and Jeu de Paume; walking tours, excursions to the Loire, Chartres and Vaucluse • **The Trans-Siberian Express**—June 6-28: Fly from Seattle to Tokyo for an adventure tour on a steamer to Nahodka and train to Khabarovsk, Irkutsk and Lake Baikal; choice of travel seminars to Samarkand, Bukhara and Tashkent or the cities of old Russia • **Great Britain***—July 25-August 8 or September 12-26: The National Gallery, the British Museum, Tate, Victoria and Albert; London walking tours; choice of excursions to the English countryside; the best of London theater • Low cost of tours includes first-class hotels, most meals, sightseeing, lectures, theater tickets and air fare. Foreign tours are heavily subscribed, so write early for additional details concerning a specific trip to Smithsonian Associates Travel Program, A&I 1270B, Smithsonian Institution, Washington, D.C. or call (202) 381-5635 for information. *Optional predeparture courses will be available for those who are interested.

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The exhibition is shown December 18-January 16 in Denver, Colorado, at the First National Bank of Denver; Carmel, Indiana, Carmel Public Library; Worcester, Massachusetts, George Gordon Library at Worcester Polytechnic Institute; Moorestown, New Jersey, Moorestown Mall Merchants Association; Sherman, Texas, Sherman Public Library; Washington, Texas, Star of the Republic Museum. For information on bringing an exhibition to your community, write: SITES, Smithsonian Institution, Washington, D.C. 20560 or call (202) 381-6631.

Regional Program in Peoria

The regional activities of the Smithsonian National Associates come to Peoria, Illinois, December 10-18. Cosponsored by Lakeview Center for the Arts and Sciences, with the assistance of Caterpillar Tractor Company, Commercial National Bank, and First Federal Savings and Loan Association, Smithsonian events include:

- Three exhibitions at Lakeview Center—"Arne Jacobsen: Danish Architect and Designer"; "America Underfoot: A History of Floor Coverings from Colonial Times to the Present"; and "Art in Nature." Special lectures accompany the exhibitions.
- The Smithsonian Chamber Players present two concerts at the Scottish Rite Cathedral. Using antique instruments, the ensemble re-creates sounds of baroque, classical and early romantic music. Workshops on instrument conservation will be conducted at Lakeview Center.
- The Nicolo Marionettes present "Alice in Wonderland."

National Associates in the Peoria area should have received invitations indicating dates and times of all Smithsonian events. For information, call (309) 685-4028.

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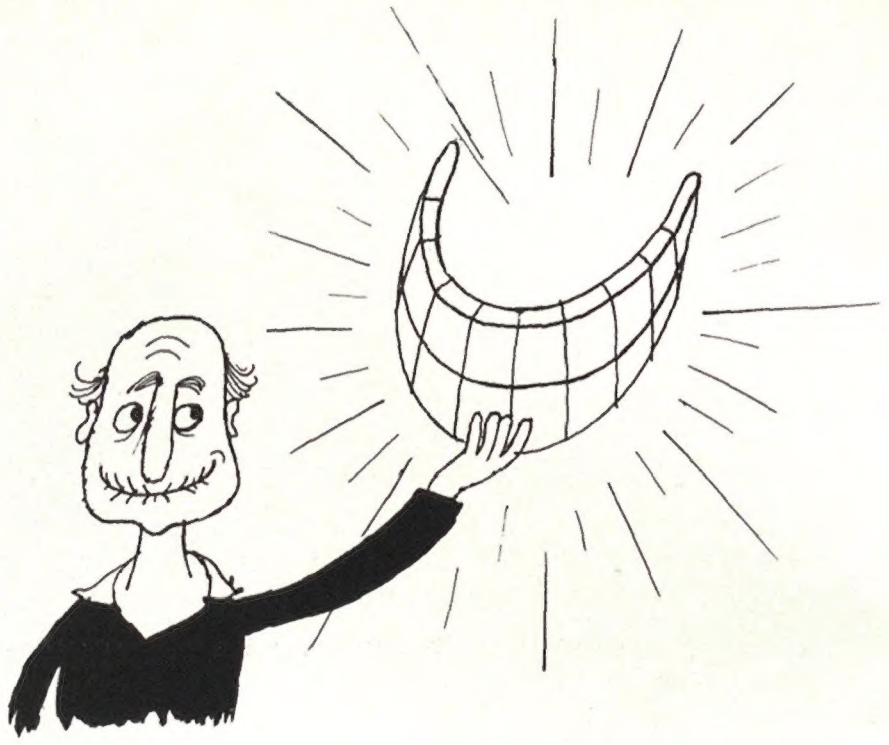
By Patrick Ryan

So keep on smilin' —*even if you* are *radioactive*



I am indebted to an American newspaper for the warning that when some 50 million Americans smile, they flash their bonhomie with radioactive teeth. In all, some 100 million U.S. citizens wear some form of denture, half of which are made of plastic and half of porcelain. Plastic choppers are nonradiating but the porcelains have to be laced with minute traces of uranium to simulate the fluorescence of natural teeth. Otherwise porcelain dentures, which gleam fine in ordinary light, may appear green, brown or black under various artificial illuminations such as the ultraviolet of the discotheque or the mercury vapor of the parking lot.

The degree of beta radiation emitted from the porcelain, I hasten to add, is quite harmless to the wearer and may, in any case, soon be further reduced under new FDA recommendations. But this use of radioactive elements to insure that replacement pearlies shine bright in all lights indicates our Western obsession with teeth that are whiter than white.

Yet a mouthful of regular, immaculate snappers has not always been considered vital to pulchritude. Mayas found it fashionable to file their front teeth to points and drill holes in them so that they could be embellished with precious stones. Medieval Japanese ladies blackened their teeth, while later Madame Butterflies went in for gilding them. Hindu beauties stained theirs in shades of red, and African lovelies once cultivated technicolor smiles by coating theirs yellow and blue.

Ancient Greeks, however, favored snow-white gnashers and were accustomed to cleaning them carefully. That the Romans were similarly inclined was confirmed by Catullus in the first century B.C. He noted that some of his contemporaries were even prepared to adopt the Spanish custom of cleaning their teeth with stale urine in the belief that it whitened them and fixed them firmly in the sockets.

Through the centuries dentifrices have included cuttlefish bones, powdered pearls, ashes of nettles, salt, tobacco, honey, vinegar, cinnamon, alum, soap, pyrethrum, sulphuric acid and a resin called dragon's blood. A leading 18th-century beauty expert advised that "A few grains of gunpowder on a chewed skewer will remove every spot and blemish and give your teeth an inconceivable whiteness." I feel he should have added the caution that if you wish to keep your upper skull attached to your lower jaw, you shouldn't light your pipe for ten minutes afterward.

My favorite recipe is one published in 1874 by Dr. Pierre Cazenave, who recommended a tooth polish compounded of half a gill each of brandy and alcohol, plus 18 grains of oil of mint, well mixed. At about the same time, Sir George Sitwell, who blessed the world with his literary offspring, Edith, Osbert and Sacheverell, was also doing his bit for tooth protection. Osbert relates in one of the volumes of his autobiography that his father was a considerable inventor, devising not only a gravity-powered mosquito net and a small revolver for shooting wasps, but also, while still a scholar at Eton, producing "a small toothbrush which played *Annie Laurie*" while in use.

I cannot say just what effect either of these two Victorian products had on anybody's choppers, but no doubt a double dose of Cazenave's Dental Mint Julep first thing in the morning, accompanied by the reminder on Sir George's Molar Harmonica that "Maxwellton's braes are bonnie," would lighten one's burdens.

Sadly, however, ever since the onset of civilization we have needed replacement teeth. They first consisted of healthy extracted teeth held in place by wires.

Although false teeth were later made of materials such as gold, ivory and porcelain, the demand for human stopgaps persisted. Even into the 19th century, young people with sound mouths could earn money for a good tooth. Long after the Battle of Waterloo in 1815, authentic substitutes known as "Waterloo Teeth" were highly esteemed because most of the battlefield corpses from which they were collected were of young, healthy men.

The first porcelain dentures were made about 1770 by a Parisian apothecary who produced a wearable pair for himself. He was assisted in this project by a dentist, who fabricated the first satisfactory man-made teeth for public sale.

Today no less than 50 million Americans can chomp their hominy grits and munch their hamburgers with radioactive dentures. What happens when a red-blooded, false-toothed American man kisses an enraptured, artificially dentured American woman? Perhaps his back hair crackles with tiny forked lightning, while her earlobes flash incandescently.

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